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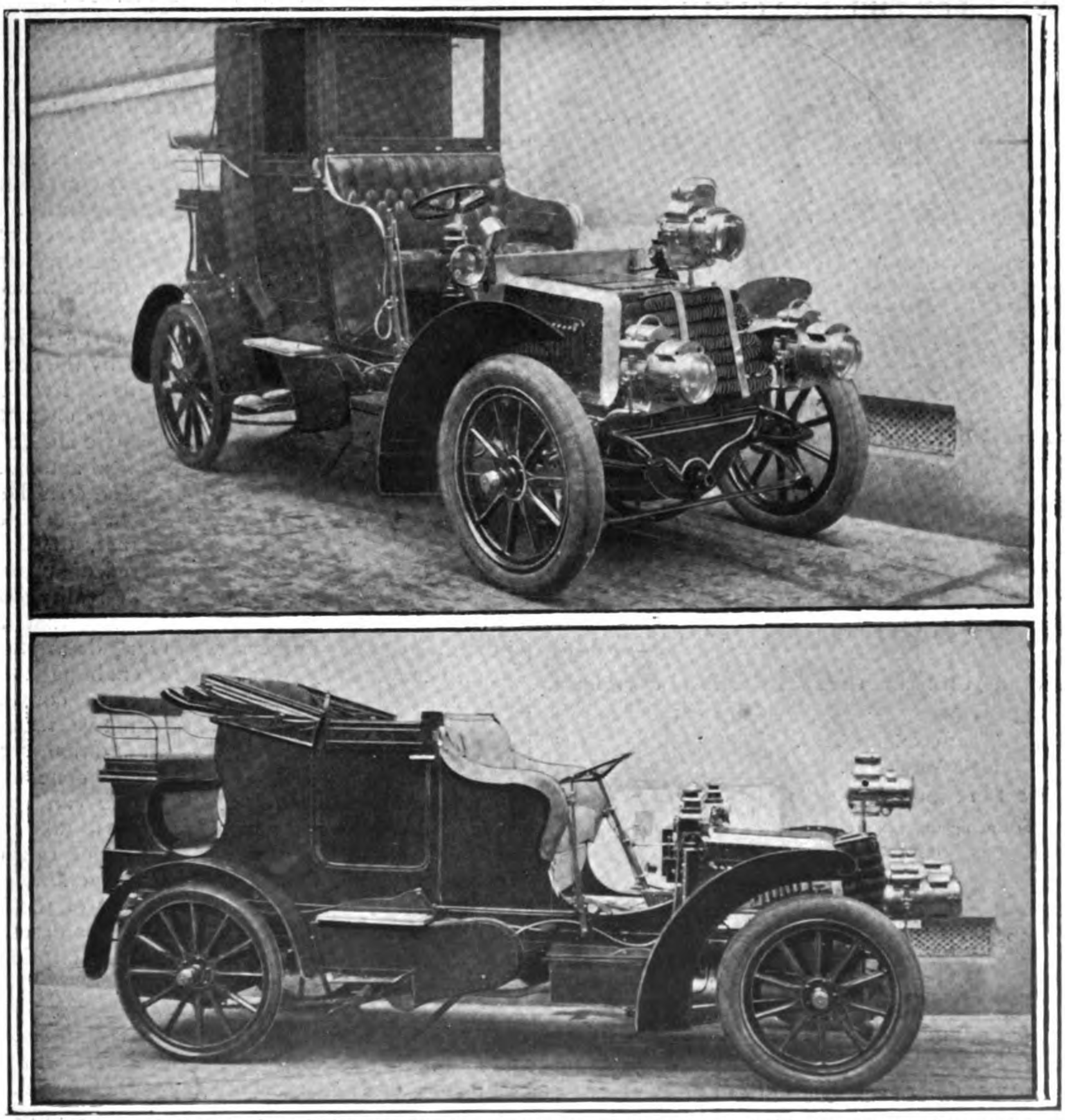

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DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.

September ...	The 1,000 Miles Trial.
1904 ...	Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.

Jan. 7–13 ...	Leeds Cycle and Motor Show (The Coliseum).
Jan. 11	Coupes de Pioule.
Jan. 16–24 ...	Stanley Club Motor Show at Earl's Court.
Jan. 30–Feb. 7 ...	Exhibition, Crystal Palace.
Feb. 3–7... ...	Liverpool Cycle and Motor Show.
Feb. 6–14 ...	Edinburgh Motor and Cycle Show.
Feb. 7–16 ...	Brussels Automobile Salon.
Feb. 9	Competition of Timing Apparatus (A. C. de F.).
Feb. 19	Consumption Trials (100 kiloms.) *L'Auto-Velo.*
Feb. 22–28 ...	Pau Automobile Week.
March	Competition of Silencers (A.C. de F.)
March	"Criterium du Quart de Litre" (*L'Auto-Velo*).
March 1–15 ...	Berlin Automobile Exhibition.
March 16–30 ...	Vienna Automobile Exhibition.
March 21–28 ...	Cordingley and Co.'s Exhibition, Agricultural Hall.
March 21–28 ...	"Criterium des Transports Automobiles." 1,095 kiloms. (*La France Automobile*).
March 28–April 5	Nice Automobile Week.
May	Paris–Madrid (A.C. de France).
June 22–24 ...	Automobile Club Fêtes—Paris.

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PASSING EVENTS.

OUR FIRST WEEKLY VOLUME.

WITH our last number we completed the first volume of our weekly series of THE AUTOMOTOR JOURNAL. We have been abundantly satisfied with the reception which has been accorded to the conversion of what was a monthly periodical treating of the more technical aspects of automobilism into a weekly magazine dealing largely with the lighter side of the subject, its social aspects, and the events of general interest which take place in connection with it. The reception which THE AUTOMOTOR JOURNAL has received in its weekly form conclusively proves that we have not only made a wise change, but made it at the right and proper moment, and this is amply borne out by the notable increase in our circulation which has resulted. Even our technical articles have been given a popular character, without sacrificing their accuracy, and in style and treatment are addressed to the sensible and practical automobilist as well as being of value to the manufacturer. In the majority of vehicles the trend of development has been for the most part in the same direction, so that, to the superficial observer, there is scarcely any difference apparent between them. The constructional details in reality, however, vary considerably, and it is these details that are all important to the purchaser. Our description of cars have been mainly directed to enabling the intelligent amateur to grasp these differences in construction and really understand what the distinctive features in the various builds of car may be. In addition, car owners are becoming progressively more and more generally their own, if not their only, drivers. No one can really drive a car satisfactorily, or be in a position to take out a car and get the best out of it for a long distance run, unless he is familiar with the details of its construction and why each has been introduced. Buyers of any of the many types of cars which we have from time to time described, will in general, at any rate in our longer descriptions, find the information they require.

WE have made a special feature of recording with accuracy all automobile events, whether in the form of race meetings, club runs, or similar occurrences, whether taking place in this country or abroad. Of course, we have given more space to some of these than to others, but we believe we have got a complete record, and that, as in the past, practically no event of interest in the automobile world has occurred which will not be found referred to and recorded in our columns. We have endeavoured to apportion the attention bestowed according to the value the events possessed for the development and future of the industry. Thus we bestowed a considerable amount of space and a great amount of time and labour on the analysis and examination of the September Reliability Trials, and of the rules and formulæ in accordance with which they were carried out. This was an event of enormous importance to automobilists, whether manufacturers or purchasers, and we dealt with the subject critically and at such length because it did not appear to us that the methods adopted by the Automobile Club Committee, excellent and well considered as they were, enabled all the data and means of comparison to be obtained from the trial that they might have afforded. This was particularly the case in regard to what we may call differentiation of one car from another as regards its capabilities for certain particular purposes. These did not emerge from the Club formulæ with any distinctness. We also laid considerable stress on the necessity of comfort as meaning practically absence of noise and vibration, to which the Club rules afforded no recognition at all. We drew up a system of proposed rules for such Trials in the future, and it is satisfactory to find that our proposals are likely to be adopted to a certain extent by the Trials Committee. That the Committee have taken our criticism in the friendly spirit in which it was intended, is evidenced by the fact of their inviting the Technical Editor of THE AUTOMOTOR JOURNAL to join the Trials Committee for next year.

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THE existing defective law of 1896 presses quite as hardly on the amateur as on any other class of automobilist—perhaps more so. He is, therefore, supremely interested in the removal of the restrictions which interfere with his amusement, and but too often necessitate his appearance in the police court for merely technical breaches of a law which is generally admitted to be superannuated, and which few but the most prejudiced sections of the community defend. Legislation has been proposed on this subject, and we have given a good deal of space to its consideration. We believe that the attitude of free but friendly criticism which we have adopted towards the measure at present put forward has tended to benefit the proposals included in it, and has commanded the sympathy of our readers. The same may be said as regards our attitude to the manner in which the law, as it now exists, has been administered during the year which has just closed. While the law of 1896 continues to be the law it must of course be administered and obeyed, but discretion is a valuable commodity which has only too often been conspicuous by its absence both in the manner in which cases against motorists are got up, and the prejudice only too frequently displayed by magistrates in dealing with them. It is not common sense to administer admittedly bad and defective laws, as has been too often done during 1902, to the injury of a growing national industry and the infliction but too often of serious hardship and injustice. We have felt this strongly and have said so plainly, and in this matter we believe our readers are with us. At any rate, the support which we have received has been most encouraging, and the personal expressions of recognition and appreciation we have received have been even more encouraging still. We beg to tender to our readers our thanks for the sympathy and support they have accorded to us, and for the lively interest they have displayed (both personally and by correspondence) in the fortunes of THE AUTOMOTOR JOURNAL. It seems at any rate to be proved that in the change of tone which we have adopted in changing the manner of our publication we have struck the note which the automobile public desire to hear.

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THE MOTOR CAR AS REVOLUTIONIST.

ON many occasions we have pointed out the peaceful revolution that the motor car is effecting in this country. It has altered the Statute Book, it has even appeared in the divorce court, and bids fair to introduce the metric system of weights and measures. This is all very nice, and as it should be. In Morocco it appears, however, according to the *Daily Telegraph*, to have produced a much more violent and far from bloodless revolution of exactly the opposite kind—a revolution in fact of reaction against progress. The Sultan of Morocco is a potentate with progressive views. He likes to progress as fast as he can, and has accordingly introduced the motor vehicle into his dominions. It seems to have been regarded by the Moors from the first with much the same feeling that the Hindoos of Kipling's story entertained for the "devil-carriage" of Yunkum Sahib. The motor car, however, was not the only thing. The roads in Morocco are far from good. To make easier running for his automobile the Sultan employed engineers to level and smooth them, and fill up the holes and ruts. This was too much for the pious Moors. It was palpably flying in the face of Nature, and presumably of Providence, and the population rose in revolt. When Li Hung Chang first attempted to introduce mining operations in China, they were interdicted by the Board of Censors as highly dangerous, since burrowing in the earth would be only too likely to awaken the sleeping dragon that slumbered beneath. Perhaps some similar terrors may have troubled the Moors; at any rate, they rebelled. Of course, it was really against Western progress that they rebelled, and they were not far wrong in looking upon the automobile as the sign and symbol of that progress, but oh! what possibilities the situation presents. Men actually in arms against the motor car! Some of our reactionaries, we feel sure, must be quite unable to sleep at night thinking of it, and we feel convinced that Colonel Wisden not unfrequently awakens from dreams that he is heading a charge of wild but valiant hillmen against the object he detests and would like to abolish. We must not forget, however, when we laugh at the Moors, that when the Gurney steam carriage attempted to make a run from London to Bath in 1831, it was met in the village of Melksham by a mob with cries of "Down with machinery!" and a furious attack was commenced upon the carriage and its inmates, several of whom were seriously injured. Mr. Gurney was much disabled, and Mr. Bailey, the principal engineer, was taken to Bath in a post-carriage, insensible from the injuries he had received Some of the small connecting-rods of the engine were injured, but the greater part of it was too hot or too sturdily built to be damaged by the mob. Probably it gave them more satisfaction to maltreat the machinists than the machinery.

A HIGHLY DESIRABLE IMPROVEMENT.

THE Roads Improvement Association, spurred on, apparently, in the main by its Secretary, is quite indefatigable. Mr. Rees Jeffreys is always bringing forward some scheme for improving either the roads themselves or the means of communication which they serve. At one time it is the question of improving their surface which engages his attention. At another it is a scheme for their better administration, and the more equable adjustment of the expenses involved for their maintenance. But it is always some proposal beneficial to road traffic, and where he finds the time and necessary energy to push them all forward is quite mysterious. In fact, if the Roads Improvement Association suffers from anything, it is from having several hares on foot at the same time. All Mr. Rees Jeffreys' schemes, however, are calculated to benefit automobilism very considerably, though they will benefit ordinary traffic, if not to the same extent, at any rate proportionately to its lesser speed.

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HIS latest suggestion is contained in an article in the "Daily Mail Year Book," and consists of an elaborate scheme of new roads and cuts through the suburbs of London, designed for the purpose of diminishing, at any rate to a certain extent, the congestion of traffic from which the metropolis at present suffers. The scheme will not affect the centre of the metropolitan area very much, but it is calculated to diminish congestion, and to facilitate locomotion in the suburbs. Mr. Rees Jeffreys proposes in the first place a number of radiating roads on routes which have been very carefully selected and surveyed, and are in general more or less parallel to a number of the existing converging high roads. That part of the scheme appears to us hardly to belong to the region of practical politics at present. The cost would be tremendous, and there is very little chance of sufficient agreement among the municipal authorities concerned for a concerted plan to be got out. But a good deal will be effected, even if the proposed roads are simply sketched out, and the districts through which it is suggested they should run are in consequence, so to speak, ear-marked as lines along which fresh roads are needed. This will do something possibly to check the encroachments of the speculative builder. In too many cases, as we have previously pointed out, he has been allowed so effectively to absorb the space which might have been successfully used for widening the main roads, or making alternative thoroughfares to them, that the needful alterations can now only be effected at enormous trouble and expense. A scheme of the kind indicated by Mr. Rees Jeffreys, when once seriously put forward, may do a good deal to prevent the further growth of this evil.

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ONE part of Mr. Rees Jeffreys' scheme—and, we venture to think, perhaps the most important—does, however, appear to us to be immediately practicable. It proposes a roughly circular road at a radius of about five miles from Charing Cross. This road would connect all the main roads in the suburbs, and prove a most unmitigated comfort to the travelling public generally. It would not only enable the traveller to skirt London if he desires to travel past it, without going through it, and so avoid much of the inconvenience of congested traffic, but it will perform another function as well. Everybody must have noticed the trouble of getting from one main road to the other. A typical instance is in the neighbourhood of Dulwich. If anybody is on the main road between the Crystal Palace and Camberwell Green, somewhere, say, in the neighbourhood of Dulwich College, and wants to get on the main road running over Brixton Hill through Streatham, he will, unless possessed of very remarkable local knowledge, get hopelessly mixed. The same thing is true to a greater or less extent on any of the main roads about the same distance out. In addition, there is the very serious extra distance involved. Mr. Rees Jeffreys' proposed circular road, which would probably be easily recognisable by anybody crossing it, would get rid of both these difficulties simultaneously. Its consummation is devoutly to be wished, and our admiration of the R.I.A. and its energetic Secretary will be still further increased if they succeed in getting even this portion of their project carried through, but we know the inertia of London authorities and we have our doubts.

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PROFESSOR HELE-SHAW'S CHRISTMAS LECTURES.

IT certainly emphasises the growing interest in the motor car to find this year's Christmas lectures at the Royal Institution devoted by Professor Hele-Shaw to the subject of self-propelled traction. The title of the course, it is true, is "Locomotion: on the earth, through the water, in the air," but the greater amount of attention has been given to automobilism in its ordinary sense. The first lecture was devoted to that ancient but valuable invention, the wheel. Professor Hele-Shaw did not go into the archæology of the subject, roughly contenting himself with roundly stating that it was at least five thousand years old. It is probably a great deal older, at least the beautifully-finished and designed wheels that have come down to us from the twelfth Egyptian dynasty seem to pre-suppose ages of earlier clumsy ones. The lectures, of course, are specially intended for young people, and Professor Hele-Shaw's manner of making the principles of the wheel readily understood by comparing its spokes to legs was suggestive and entertaining. Naturally a good deal of space was given to the subject of road resistance to traction. The second lecture dealt with the growth of road locomotion during the past two hundred years, and effectively covered all the ground from the early steam carriages up to the petrol, steam, and electric cars of the present day, particular attention being given, as was natural considering the audience, to the motor bicycle. We are not quite sure that the lecturer gave an adequate explanation of the ultimate failure of the early steam vehicles. He attributes it to inherent mechanical defects, and to the opposition of horse owners and prohibitory legislation, which is usually assigned as the chief cause. We have repeatedly pointed out that the death blow was given by the levying of unjust and unreasonable tolls, which Parliament did nothing to prevent; repressive legislation was not introduced till the sixties. Professor Hele-Shaw concluded his second lecture with a piece of good advice to motor car drivers generally. He suggested that, just as steamers always got out of the way of sailing ships, so drivers of motor cars should get out of the way of foot passengers who were using the road, and even stop if necessary, rather than blow a horn and see how close to them they could go. If that were done he thought a different view would be taken by the public of motor cars. This is excellent advice. It is followed, no doubt, by careful drivers at present. We should like to see this spirit adopted universally.

THE NEW
PUBLIC
ASTOR, LENOX AND
TILDEN FOUNDATIONS.

THE WARTBURG LIGHT PETROL CARS.

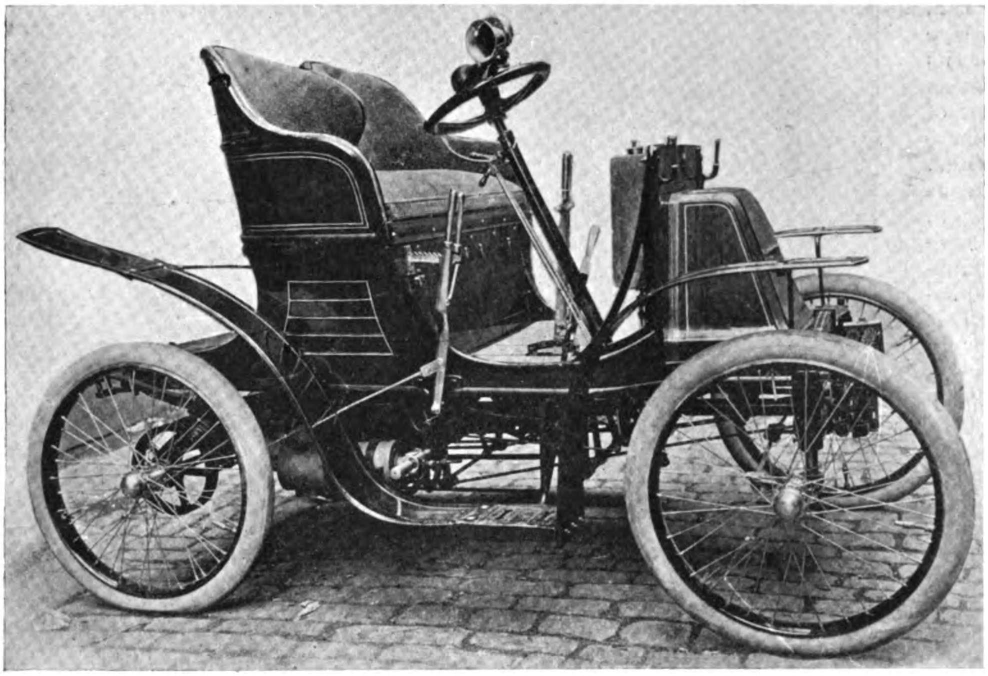


FIG. 1.—5-h.p. Wartburg Voiturette (No. 1 Model).

REFERENCE has already been made in our columns to the cars manufactured by the Wartburg Company, and imported into this country by Messrs. Haynes and Son, Limited, of Goswell Road. The large German concern has taken up the construction of automobiles, ranging in size from small voiturettes to lurries carrying heavy loads. The pleasure vehicles were mentioned briefly in connection with the recent National Exhibition, and we described the lurries in our issue of the 9th of August last.

The private cars are made in various sizes, and at prices from 160 guineas upwards. Two of the smaller types have already arrived in London, and have been carefully examined by ourselves. These are intended to meet the large demand which has of late made itself so forcibly felt for low-priced vehicles of strong construction and comparatively high power. The makers have decided to fit motors having at least two cylinders to all their cars, and have five patterns in which twin-cylinder engines are employed. Of the larger sizes than these, which have 4-cylinder motors, we do not propose to say anything at present, but we learn that several such models, including those of 15, 18, and 22-h.p., may be expected over here shortly. In the majority of cases the motor is placed in front in the usual manner, and it is only in the smallest car that it is mounted at the back instead. Our illustrations, which are reproduced from photographs taken by ourselves, represent No. 1 and No. 3 models, and it will be noticed that they not only have a distinctive appearance, but that they differ to some extent in design from most other voiturettes on the market.

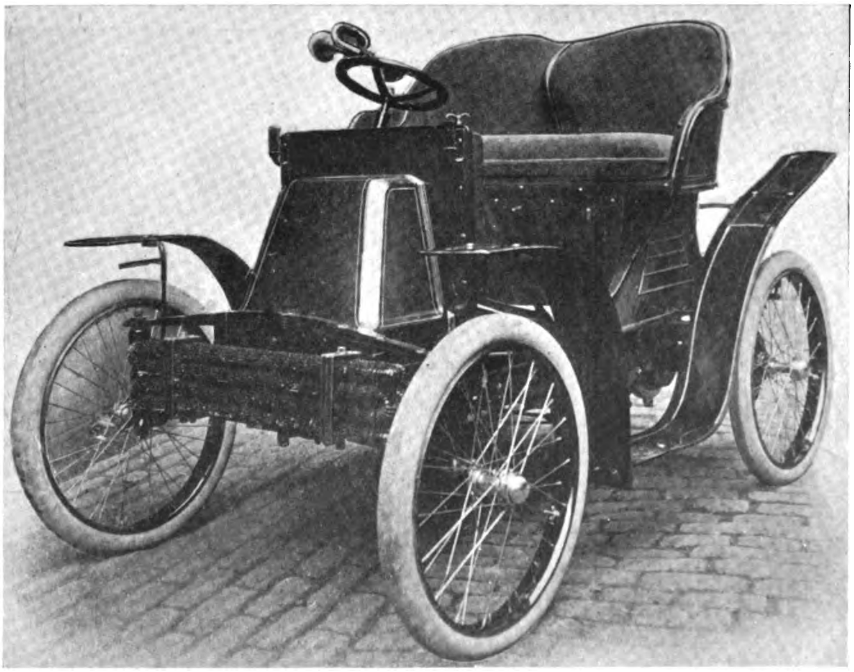


FIG. 2.—5-h.p. Wartburg Voiturette.

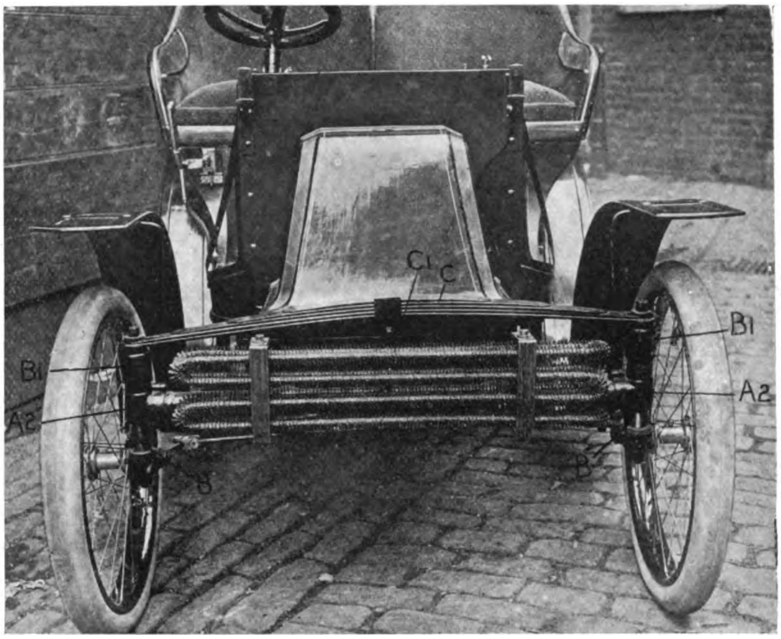


FIG. 3.—Front View of 5-h.p. Wartburg Voiturette.

The No. 1 vehicle is seen in Figs. 1, 2, and 3, which give a good idea of its general appearance. The greater part of the driving mechanism, as already stated, is at the back, as shown in Fig. 4. The vehicle is constructed with a tubular framework beneath the body. It carries the body in front by hinges on each side, and it supports it at the rear upon short semi-elliptical springs arranged between the prolonged rear tube, A, of the frame and the body. The rear axle, E^2, runs in four ball bearings, held by downwardly - sloping brackets, A^1, from the back member of the frame; it is provided with a differential gear in which spur planet wheels are employed instead of bevel wheels, and the two halves of the live axle are exposed to view throughout the greater part of their length. It will be seen that no springs are inserted between the rear axle and the frame, but that the springs are introduced between the frame and the body at this end, the body being free to move about the hinges in front. The frame consists of two longitudinal members, and is considerably narrower than the body. The side members are stiffened by ties of girder construction, which extend from the one end to the other beneath each tube. The ties are made of steel rods, and the vertical struts between them and the tube are hinged at both ends, and are, therefore, self aligning.

The front cross tube of the frame projects at each side, and terminates in vertical sockets, A^2, which are rigid with it, and which form the bearings for the steering heads, B, of the front wheels. These sockets are free to slide up and down on the steering heads, and the heads terminate at the upper ends in thimbles, B^1, from which a transverse leaf spring, C, passes across the front of the car. The spring is held in place at each end by nuts and washers, and the holes through which the bolts pass are slotted to allow it full play. The frame and the body are supported by this spring, a swinging link, C^1, passing downward from its centre to the front tube of the frame. The sockets in which the steering heads move, not only take a bearing upon them, but also slide inside the thimbles at the top of the heads, for they have to take any tendency which there may be for the front wheels to move over sideways. This method of suspension, although not

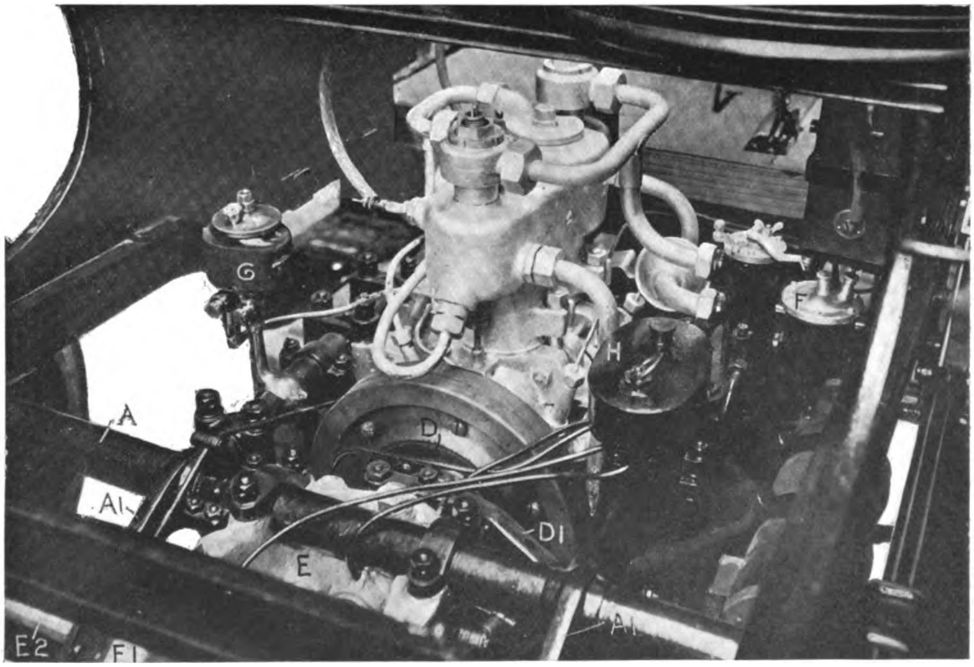


FIG. 4.—5-h.p. Voiturette.—Rear Portion of Tubular Frame, carrying Engine and Transmission Gear.

entirely novel, differs in minor respects from other well-known designs and retains the advantages of cheapness of construction, resulting from a partial suspension of the framework carrying the driving mechanism.

The engine, which gives 5-h.p., is of the vertical type, and each of the cylinders is separately bolted to the top of the crank chamber by two swinging bolts passing through flanges at the cylinder base. The valve chambers lie front and back respectively, and contain atmospheric inlet valves placed immediately above the exhaust valves. The ignition plugs fit into the sides of the valve chamber, and are of the usual high-tension pattern. The cylinder heads with the valve chambers are water jacketed, and the springs of the inlet valves are exposed to view. The crank chamber is made in two parts, with a central vertical joint between them. The engine is fixed by feet projecting from the crank chamber to the side members of the frame, so that the crank shaft lies longitudinally in the car. The forward end of the shaft projects some little distance from the crank shaft, where it is coupled direct to a circulating pump of the gear wheel type. The shaft carries a bevel wheel between the engine and the pump, and a cross shaft, which is adapted to take the starting handle, is fitted with a corresponding bevel wheel at its inner end which engages with the wheel on the crank shaft. The starting shaft projects on the right-hand side of the car above the step, and is so arranged that its bevel wheel can be drawn out of engagement with the crank shaft. It is, however, provided with a free wheel clutch, so that it is not driven by the engine even if the driver omits to disengage the bevel wheels.

The change-speed gear, which provides three forward speeds and a reverse, is enclosed in a neat aluminium case, E, which also surrounds a part of the differential gear, at E^1, on the live axle. The gear box is clipped to the main frame, as seen in Fig. 4. The first-motion shaft in it is in line with the engine shaft, and its front end, which is of a square section, lies inside a corresponding square hole in the male member of an internal cone clutch, D, formed in the flywheel. The clutch is operated by a foot pedal in front of the driver in much the usual manner, and the fork, D^1, which actually presses the clutch member inwards is seen in our illustration. Inside the gear box there are three spur wheels on the first-motion shaft which are always in mesh with three corresponding wheels on the second-motion shaft, the two shafts being on the same horizontal plane. The first-motion shaft is so arranged in conjunction with its gear wheels that either one or other of them can be rendered rigid with it by sliding it longitudinally through them. For this purpose it is provided with a short, squared portion, the square engaging in corresponding holes in either gear wheel alternatively. The power is transmitted from the rear end of the second-motion shaft to the shell of the differential gear by bevel gearing. The reversing gear consists of an intermediate pinion which can be brought into engagement with a fixed wheel on the first-motion shaft, and with one of the wheels on the second motion shaft. The forward speeds are controlled by the longer of two hand levers to the left of the steering pillar, and the reverse gear is brought into action by the shorter lever, which is seen alongside it in Fig. 1.

The remaining details of this machine do not call for any very detailed description. The carburettor, F, is of the Longuemare type, the cam gear on the engine is lubricated by the sight feed lubricator, G, seen on the left in Fig. 4, the crank chambers receive their supply of oil from a hand pump fitted in the oil tank on the dash, and the bearings of the gear box are fed from another lubricator, H, near the engine. A band brake acting upon the differential gear immediately outside the gear box is operated by a foot pedal, and there is a brake drum at each end of the live axle. These latter brakes are applied by a side hand lever, the connection between the two being made through the rear tube, A, of the frame. The petrol tank is made in one with the tank containing the lubricating oil, and is fixed behind the dashboard. The water tank occupies the space provided by the small bonnet in front, and the cooling water is forced through a finned-tube radiator clipped to the front member of the frame.

The vehicle which we examined is fitted with wire wheels and with Continental pneumatic tyres. In any of these cars, however, wooden wheels will be provided instead, at the same price, if desired. The steering-gear is of the wheel type, with inclined pillar; the connection between it and the steering heads being by levers and connecting rods. The batteries and ignition coil are neatly fitted at each side beneath the seat, and are visible in Fig. 4.

We understand that in future models one lever will be used for the forward speeds and for the reverse, and that it will be placed at the side of the car instead of in the position hitherto adopted.

The larger vehicle is seen in Figs. 5 and 6, whilst in Fig. 7 the front portion of it, with the bonnet lifted up, is shown. In general respects the construction of this car, as far as the frame is concerned, is similar to the No. 1 model, the method of suspension being identical except that spiral springs, B^2 and B^3, are employed in front instead of a transverse leaf spring. The springs are clearly seen in Fig. 7, and it will also be noticed that the sockets, A^2, which are rigid with the tubular framework, are considerably longer, and therefore give a more rigid support to the steering heads, B. The engine is of precisely the same design as in the smaller car, but it is slightly larger in every way, and is said to develop considerably more than its nominal 5½ h.p. It is bolted to the side members of the frame by four feet projecting from the crank chamber, and it carries a friction clutch of the same pattern immediately behind the crank chamber. The male portion of the clutch rides upon a shaft which is carried in a substantial bearing projecting downwards from a cross member of the frame beneath the dash. This bearing bracket provides the necessary support for the levers, operating the clutch and connecting it with the foot pedal. The foot pedals are fulcrumed on a cross rod, which is held in place at a lower level than the frame by stay rods, which stiffen the side members of the frame, as in the smaller car. In this model the circulating pump is fixed to the crank chamber beneath the main shaft in front, and the radiator on the vehicle consists of two finned tubes fixed in front of the frame, and of an additional radiator of the same pattern placed horizontally beneath the floor. The starting handle is detachable, and fits the front end of the crank shaft

The power is transmitted from the main clutch to the change gear through a longitudinal shaft having flexible couplings at each end. The gear-box is made in three pieces, which together enclose both the change gear and the differential gear. Two parts of it form an upper and lower casing, above and below the centres of the first and second-motion shafts, and the third piece has a vertical joint, and forms the rear cover to the differential. The upper casting has projecting feet by which the box is secured to the frame. Three forward speeds and a reverse

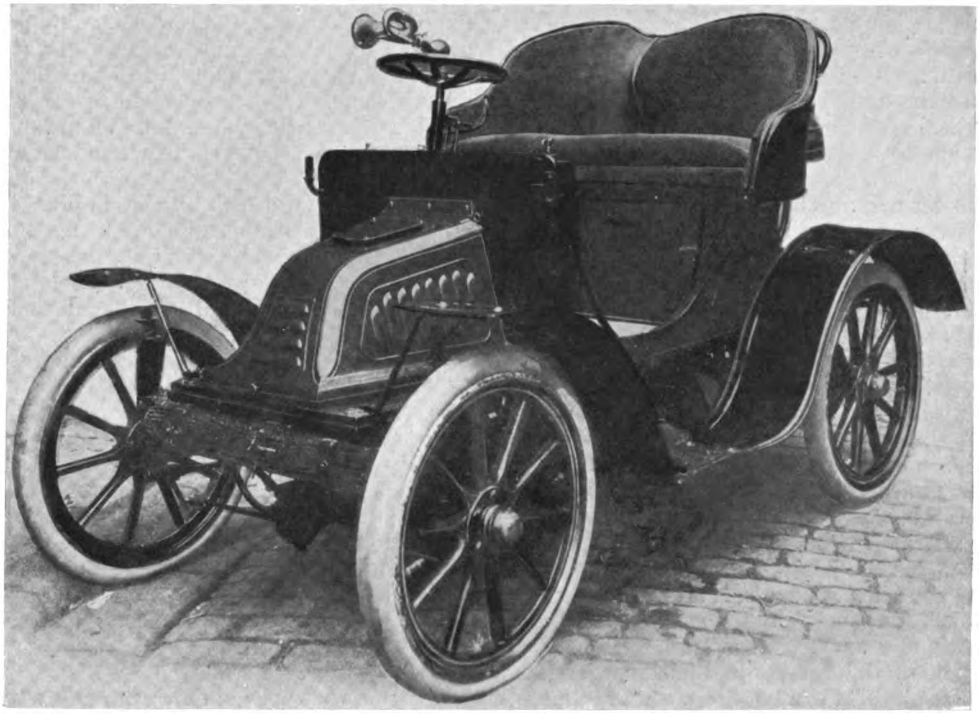


FIG. 5.—5½-h.p. Wartburg Voiturette (No. 3 Model).

are provided, the gear-wheels on the first-motion shaft being rigid with it, and those on the second-motion shaft sliding upon it. The second-motion shaft is connected with the differential by bevel gear wheels. The sliding wheels are controlled by a lever to the left of the steering pillar, the one lever serving for bringing the reverse into operation as well as the forward speeds. As in the smaller cars, a side lever will be substituted in future.

The rear axle is of precisely the same construction as in No. 1 model, the only difference being that five ball bearings support it instead of four. A foot pedal controls the band brake on the differential, and a side lever applies both rear

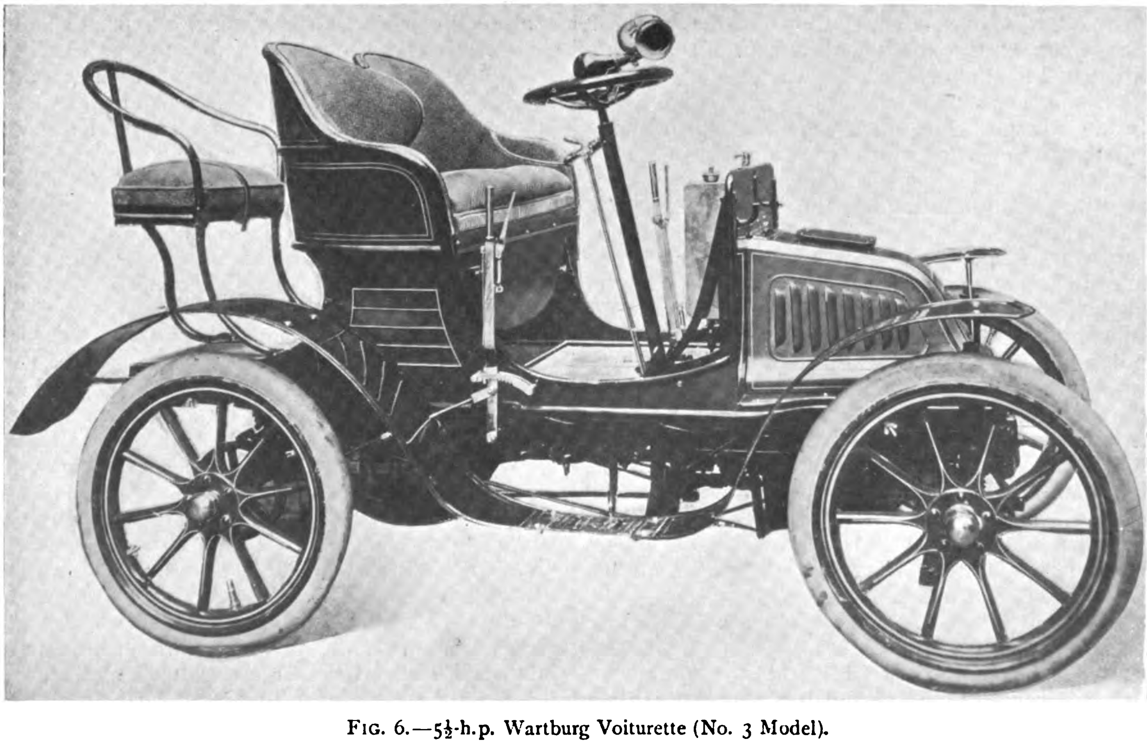


FIG. 6.—5½-h.p. Wartburg Voiturette (No. 3 Model).

wheel brakes as in the other model. The change-speed gear bearings are lubricated from a lubricator which is placed beneath the front seat and is accessible through a trap door from behind. The engine receives its supply of oil from a hand pump in the lubricator tank on the dashboard. A separate sight feed lubricator, L, is fixed inside the bonnet on the front side of the dashboard. It feeds the cam gear of the engine, and the bearings of the main clutch. The petrol tank together with the oil tank are behind the dash, and the water tank is fixed beneath the front seat. The steering gear is much the same as in the other car and the pillar is similarly held by a bracket which is built into the tubular frame.

In both cars the usual small hand-levers for regulating the speed of the engines are fitted to the steering pillar. One of these adjusts the time of ignition and the other regulates the carburettor, F. Provision has been made by which every drop of water can be drained from the jackets, pipes, tanks and radiators in cold weather, and in both cars the horn is fixed to a bracket which projects upwards from the centre of the steering wheel, and thus leaves the rim of the wheel clear for the driver's hands. The tanks are intended to be of sufficient size for enabling the cars to run about 100 miles without refilling. The bodies are well made and nicely finished, they are, in all cases, fitted with "tub" seats in front, and are upholstered in corderoy. The No. 3 vehicle has a spider seat behind, and it is in this respect that it chiefly differs from the No. 2 model, although the wheel base of that intermediate car is also somewhat shorter. In the No. 1 model, the front seat is hinged so that it can be tilted up forwards, and the space beneath it is fitted as a tool box, the tools being thus readily accessible. The bodies are built entirely of wood, though in the No. 3 model the sides of the front seat are stiffened by steel. A safety plug, which can be removed when leaving the car, and which disconnects the electrical circuit, is fitted to the bodies near the driver; it is one of those little details which are often appreciated by an owner.

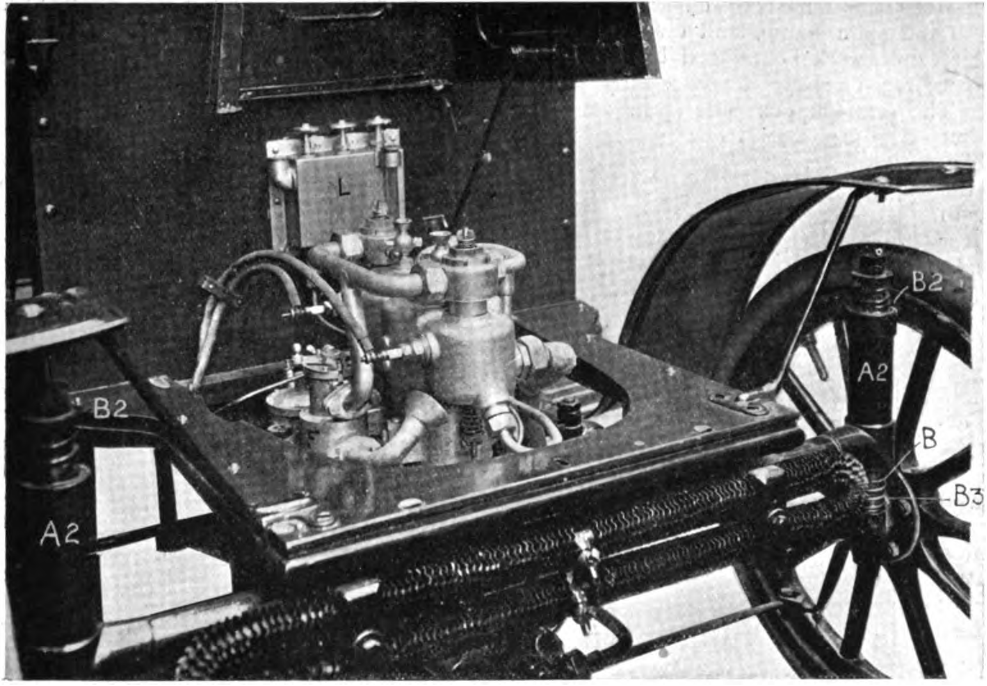


Fig. 7.—Front Portion of Voiturette (No. 3) with Bonnet raised.

We have not as yet had an opportunity of taking a run on either of these cars, although we have seen the engines on both running. They appear, however, to be very capable vehicles. and the vibration on the smaller one is remarkably slight. Considering the size of the engines, and that the weight of the two machines is only 9 and 12 cwt. respectively, they should prove very speedy and serviceable. The method of suspension would apparently ensure comfort and easy riding, although the rear springs are very short. The price at which they are being put on the market is sure to secure them a wide popularity. The No. 1 car costs 160 guineas, and the No. 3 is 190 guineas, whilst the intermediary No. 2 is priced at 185 guineas.

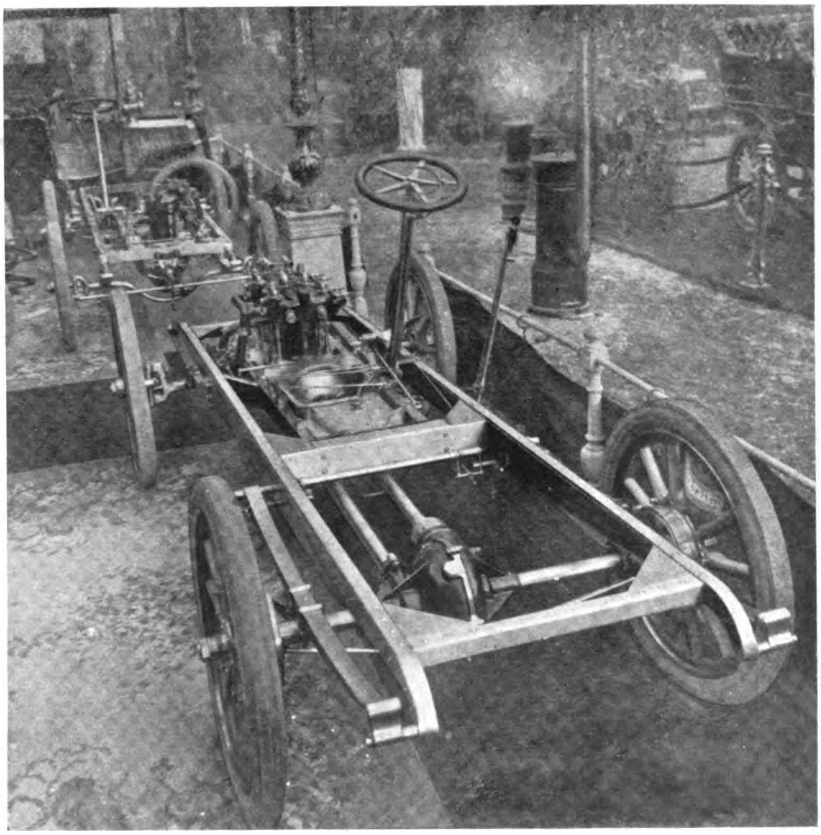
The manufacturers are arranging to supply small delivery vans, using the same chassis, and intend to push their sale amongst tradesmen in this country. As far as we can form an opinion from a preliminary examination, we have no hesitation in saying that the Wartburg light petrol cars are well worth the price charged for them; the employment of a twin cylinder motor in itself is an advantage which is not often found in cars of so small a size.

The Paris Municipal Council have just received the report of the commission appointed to inquire into the desirability of employing automotor fire engines. The report recommends the adoption of the engine shown at the Exhibition of 1900, which, in addition to rapid speed has the advantage of carrying a supply of water in itself, and so being able to combat a fire immediately on its arrival without waiting for the hose to be attached to the fire plugs. If adopted, a saving of £80 or £90 per annum in the cost of maintenance of each engine is anticipated.

THE ANNUAL A.C.F. SHOW IN PARIS.—Part III.

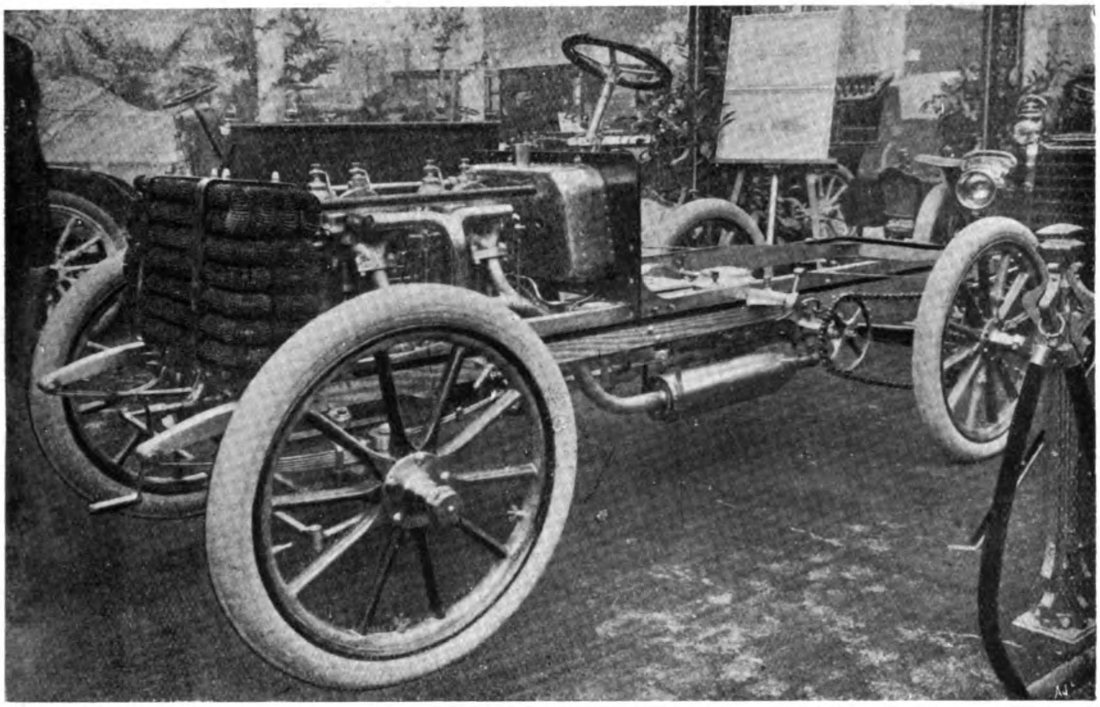
Messrs. A. Darracq et Cie. showed three chassis which attracted a considerable amount of attention from the visitors. One of these was their 20-h.p. 4-cylinder vehicle, and the other two were the twin-cylinder 12-h.p. and the single cylinder 8-h.p. cars of latest design. In all these models the system of transmitting the power from the engine in front is by a longitudinal shaft and bevel gearing to a live axle. In the big car the main frame is made of special stamped steel, and the underframe is of similar construction, rigidly secured to the main frame, and on a little lower level than it. The framework is stiffened by angle plates at each of the corners; its shape is very clearly seen in our illustration. The semi-elliptical side springs are very long, and have but little camber. The engine is of the 4-cylinder type, in which each pair forms a single casting. The inlet valves, which are mechanically operated, are arranged on the right hand side, and the exhaust valves on the left hand side of the cylinder heads. The usual inspection plugs are fitted above each valve, and each pair of them is held down by a yoke and a single nut. The water pipes lead into and pass out from the top of the jackets in a similar manner to that adopted on the Decauville car, described by us last week. The general arrangement of the crank chamber, with its enclosed cam shafts, governor, and gear wheels, is much the same as in other new models. The enclosing castings are made of aluminium, and the necessary fittings are provided for fixing the engine to the underframe. A single exhaust pipe leads to the exhaust box from a branched pipe-fitting communicating with both pairs of cylinders; the exhaust box lies on the left-hand side of the vehicle. The circulating pump is placed beneath the front end of the crank shaft and is driven by spur gearing. The three chassis were shown without any coolers, but we understand that radiators of the honeycomb pattern are employed. The engine has a particularly neat appearance, which is largely accounted for by the excellence of the cylinder castings. The ignition is of the high tension type, the plugs being fitted horizontally into the valve chamber walls immediately above the inlet valves.

The change-speed gear, which is supported by the underframe, is connected with the engine by a friction clutch of the cone type; the clutch spring is fixed between it and the gear box. The change-speed gear provides a direct drive through on the top speed, and the power is taken from it to the differential gear by a longitudinal shaft. A powerful brake, with metal blocks operating on the brake drum, is fitted on the shaft immediately behind the gear box. The rear axle is of special construction, and is stiffened by stays beneath it. It is maintained in the required position relatively to the change gear by a strong tubular distance rod which passes from the casing surrounding the differential gear and the bevel wheels up to the underframe. The revolving parts contained about the rear axle are carried in well designed bearings, and the thrust of the bevel wheels is taken by separate ball-bearings. The different gears are brought into play by a horizontal lever working over a quadrant on the steering pillar. The speed of the engine is controlled by a small hand lever on the upper side of the steering wheel. The usual side brakes are fitted, and are connected together through a compensating device with the side lever.



The 20-h.p. Darracq Chassis.

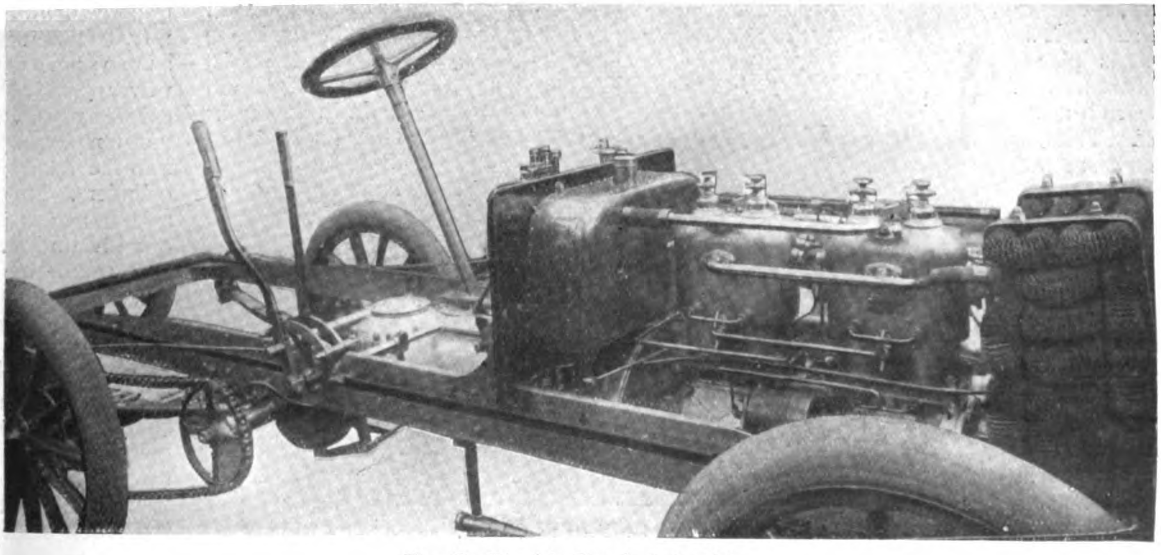
In the 2-cylinder model the main frame is built of wood with steel flitch plates, and is stiffened by angle plates at the corners. The underframe is constructed of special angle steel, and carries the engine and the change gear, as in the larger model. The engine is of 12-h.p., and has atmospheric inlet valves. They are arranged immediately about the exhaust valves, and have their springs exposed to view. The ignition plugs are fitted into the tops of the cylinders. The water is led into the water-jackets at the bottom. The change-speed gear is arranged in a similar manner to that adopted on the larger chassis, and the same form of distance rod is used.



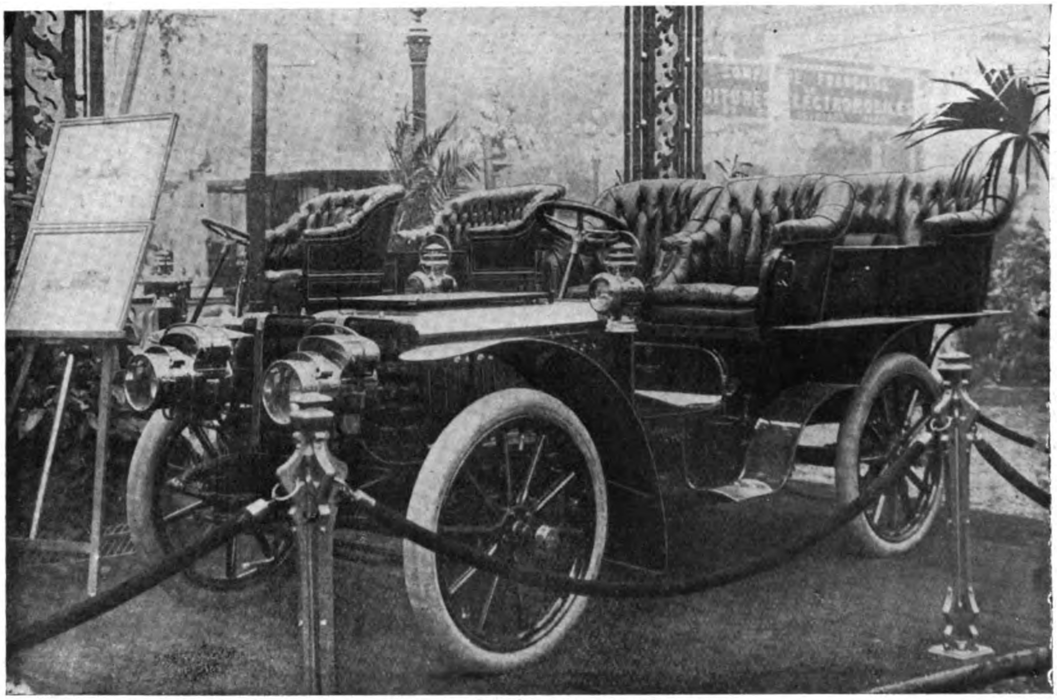
The De Dietrich Chassis (right side).

The single-cylinder car has a similar frame and transmission to the 2-cylinder model, except that no distance rod is employed and that the valve chamber is in front of the cylinder instead of being at the side. A centrifugal governor in all cases acts on a throttle valve, which is fitted on this chassis close up to the cylinder casting. The valves can be removed without disturbing the pipes leading to them. All three chassis were finished off with the greatest care, and, like so many others in the show, drew the attention of many who were probably more attracted by the "Exhibition finish" than by the more important good features. The makers also showed models of their completed vehicles on this well-arranged stall.

Messrs. De Dietrich et Cie. had a fine exhibit showing several of their well-known vehicles complete, and one chassis. These were of the latest Turcat-Mery pattern, and although the company have not adopted the many radical departures which were found on other makers' stalls, yet their vehicles are certainly to be numbered amongst the best made which now exist; they have taken full advantage of previous practice, and many minor improvements which add to reliability and convenience have been adopted on their last models. Three views of the chassis are reproduced by us, these giving a very clear idea of its general arrangement. The main frame is of wood and steel, and a separate underframe carries the 4-cylinder

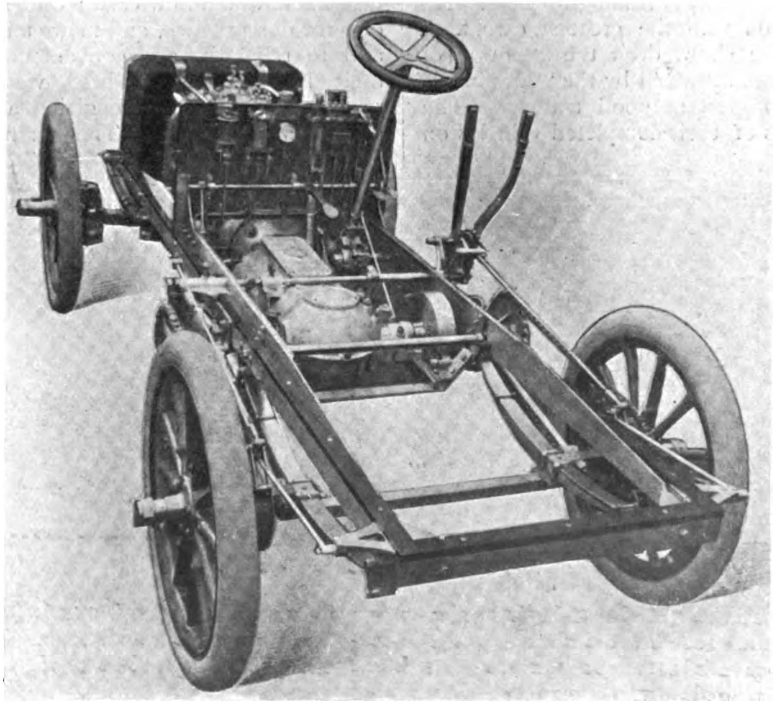


The De Dietrich Chassis (left side).



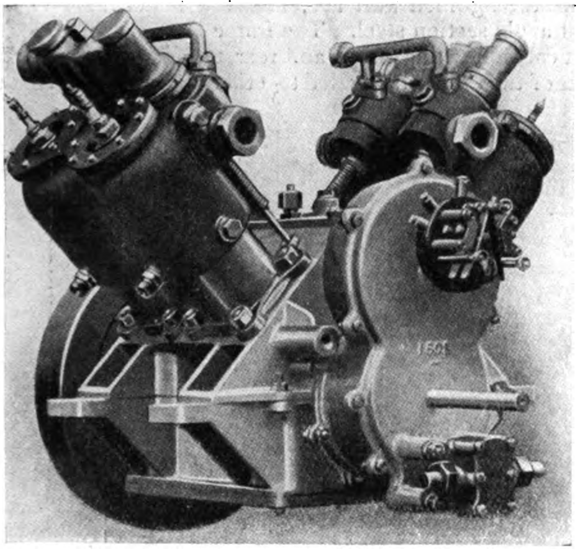
One of the Turcat-Mery De Dietrich Cars.

engine and the change-speed gear. The side springs are of the semi-elliptic form, and their leaves are held together by additional clips between the points at which they are fixed to the axles and to the frame. The cylinders are cast in pairs and are bolted to an unusually long crank chamber which provides bearings of ample dimensions for the crank shaft. The usual atmospheric inlet valves are used, but a low-tension system of ignition is adopted, the current for which is generated by a magneto driven by spur gearing. The circulating pump is connected by a chain with a sprocket wheel on the front end of the crank shaft. The water tank is placed immediately in front of the dashboard beneath the bonnet. The first and second motion shafts of the change-speed gear are arranged on the same horizontal plane; the sliding spur wheels are mounted on the former, and the latter drives the differential countershaft through bevel gear. The sliding wheels are not fitted upon a squared shaft as hitherto, but a special cross section is formed by milling four equidistant slots along the shaft, thus leaving four projecting ridges to engage in corresponding recesses in the hubs of the sliding wheels. We noticed that a somewhat similar practice had been adopted by other makers, and it is easy to see that several advantages are gained by it.

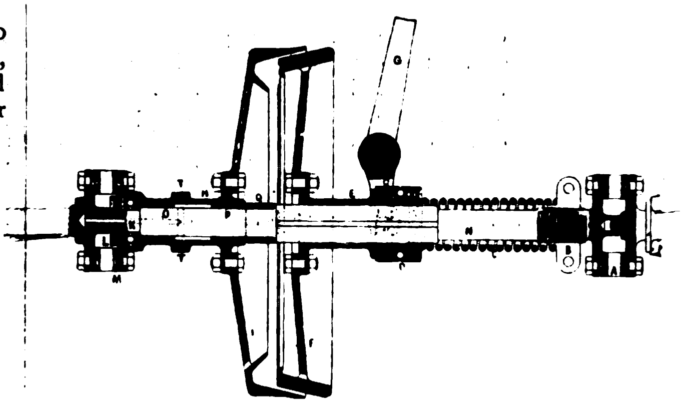


The De Dietrich Chassis.

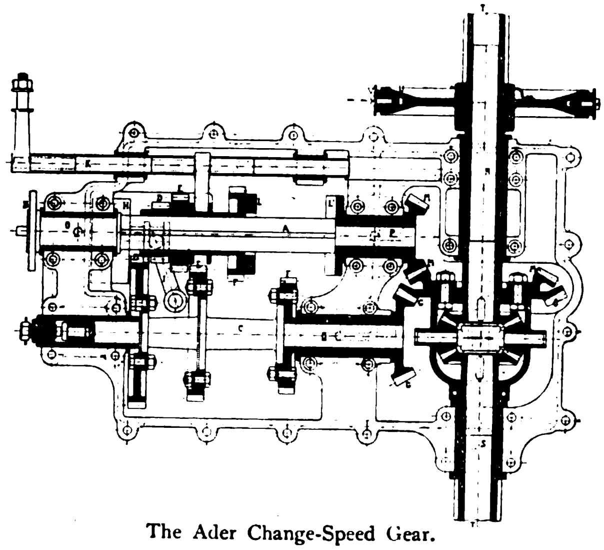
The chief novelty on the Ader Stall was the 4-cylinder motor, which in general respects resembles their previous double-cylinder engine. Each pair is cast in one piece and is set at an angle of 45 degrees from the vertical; the crank shaft has only two crank pins, on to each of which the connecting rods from the opposite cylinders operate. The motor has atmospheric inlet valves placed above the exhaust valves, and the ignition plugs are fitted into the heads of the cylinders. Its general appearance is seen in our illustration. We also reproduce drawings of the latest pattern main clutch adopted by the company, and of their change-speed transmission gear. The clutch is so designed that the thrust is taken by ball bearings, and is not imposed upon the crank shaft or on the first-motion shaft. The change-speed gear is similar to the Mors design, the drive being direct through the shaft, A, and the clutch jaws, L and L^1, to the bevel wheel, M, and thus to the differential gear, when on the top speed. For the lower speeds the power is transmitted through the second-motion shaft, C, and its bevel wheel, G, to the differential. The sliding wheels, D, E, and F, are mounted upon a square formed on the shaft, A, and the back face of the wheel, F, forms the one part of the jaw clutch for the top speed. The company showed one of their 2-cylinder and one of their 4-cylinder motors separately, and they also exhibited a couple of complete chassis on their stall. The main frame employed is tubular, and the



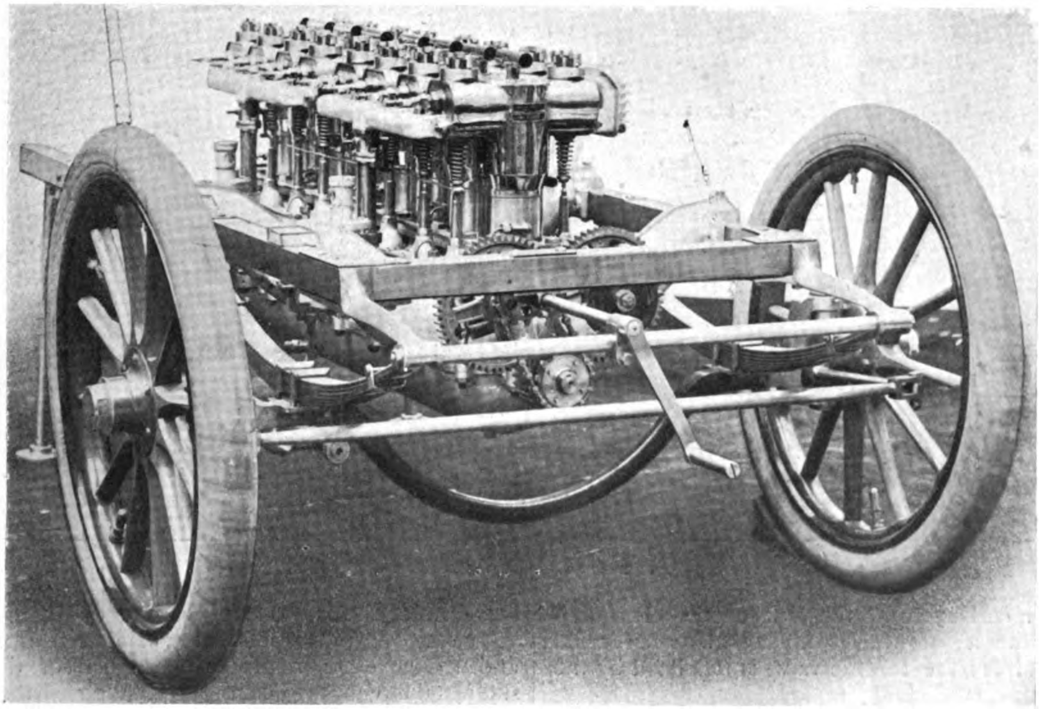
The Ader 4-Cylinder Engine.



The Ader Main Clutch.



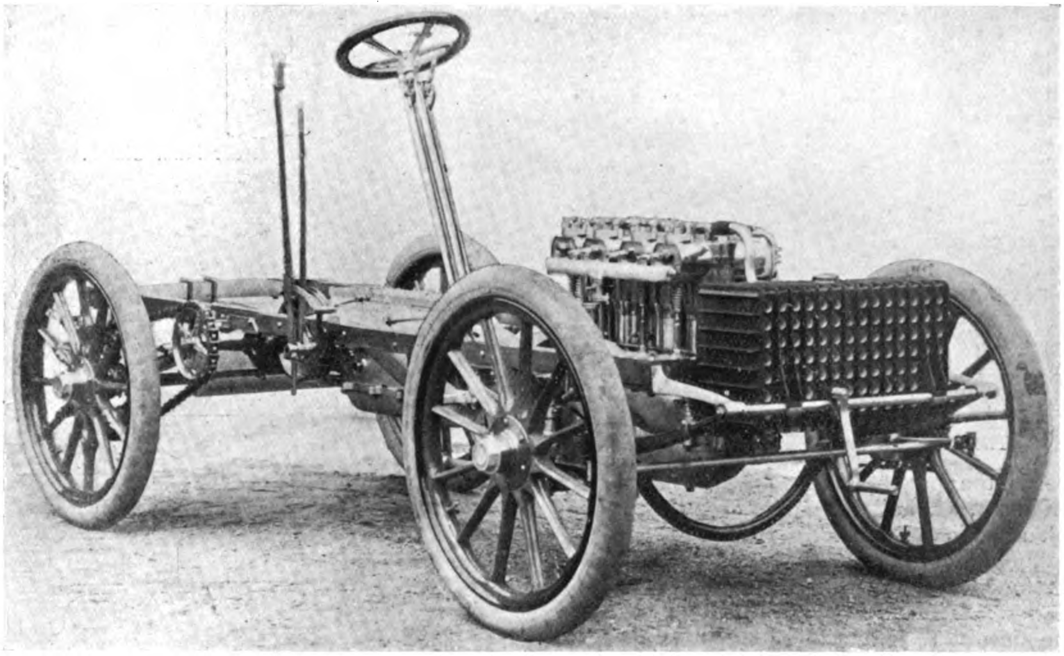
The Ader Change-Speed Gear.



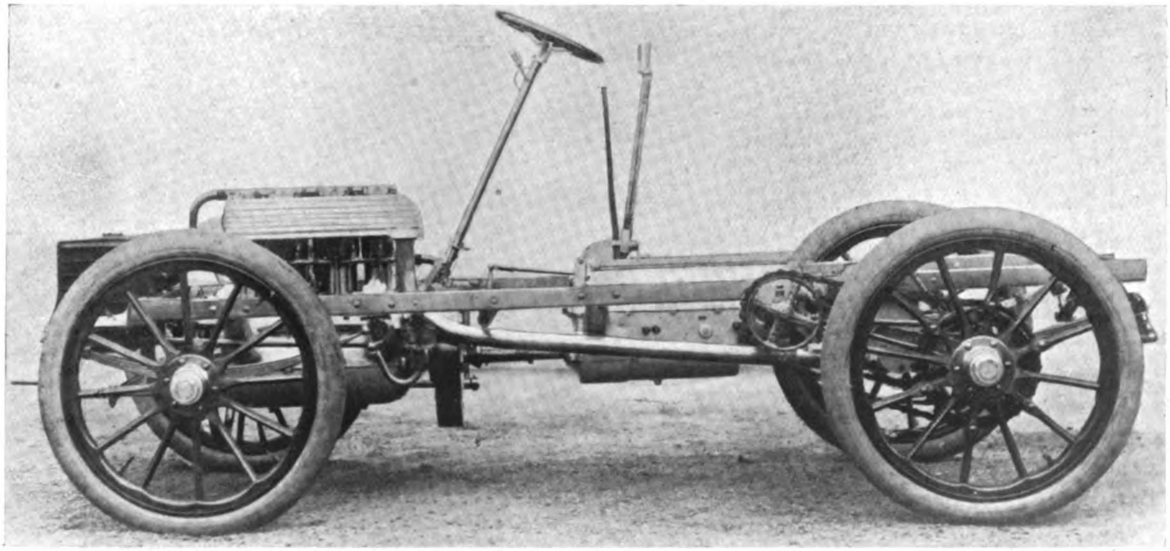
The 8-Cylinder C. G. V. Engine, and front portion of Chassis.

underframe is dispensed with. The gear-box is supported at the back by the countershaft, and is secured at its front end by a swinging link to the frame. A separate lever is used for bringing the reverse pinion into play, and the forward speeds are operated by a side lever, the shaft of which passes direct into the gear-box. The countershaft is connected with the rear wheels by side chains in the usual way. Another interesting feature of these cars is the employment of a carburettor of the surface type. It is used in connection with a throttle valve, placed between it and the induction valves; the throttle valve is regulated by the governor.

Messrs. Charron, Girardot, and Voigt showed one of their 1902 type 15-h.p. chassis and also a nearly completed 20-h.p. 1903 chassis. In the earlier model the motor is of the 4-cylinder type with atmospheric inlet valves, and each pair of cylinders is cast together. The main frame is of square tubing lined with ash, and the underframe is built up of angle section steel. The frame is supported on semi-elliptical side springs front and rear, the forwardly projecting horns of the former being tied together by a cross bar, and the rear ends of the latter being carried by an inverted transverse spring. In this model the cam shaft is not enclosed, and the governor regulates the speed of the motor by sliding the exhaust cams along their shafts, and thus cutting out one cylinder after another. The lubrication is



The 20-h.p. C. G. V. Chassis, with Steel Cylinder Engine and Multitubular Cooler.



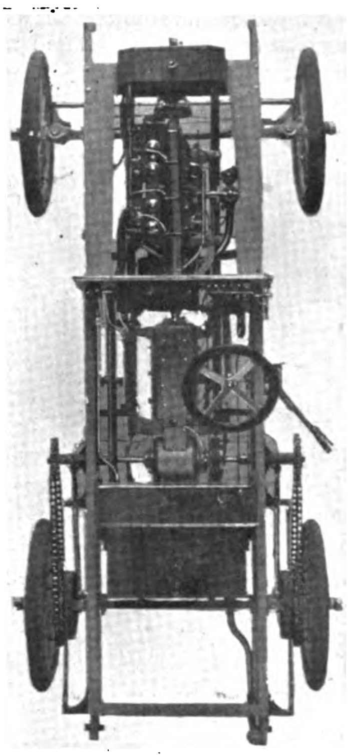
The 20-h.p. C. G. V. Chassis.

effected by a pump driven by spiral gearing from the rear end of the cam shaft, and fixed to the dashboard. A single carburettor is used for all four cylinders, and a throttle valve is fitted in the pipe leading to each pair of valves. The throttle valve is regulated from the steering pillar and the time of ignition is also controlled by a similar hand-lever alongside it.

The new 20-h.p. chassis, which is to replace last year's 15-h.p. model, weighs 51 kilogs. less than the older machine. So far as the frame is concerned there is but little difference in construction, except that the underframe has been entirely dispensed with. The motor is of their special steel cylinder type, which we have already described. The engine is fixed to the main frame by four feet, which project from the upper casting of the crank chamber. The two cam shafts lie on either side of the crank chamber, and the cams themselves are enclosed in neat little casings. Spiral gearing is retained for driving the lubricating pump, and a similar form of gear connects the rear end of the other counter-shaft with the water circulating pump. The ignition plugs are of the high-tension type, and are fixed horizontally into the valve chambers immediately above the inlet valves. The governor is fitted to the front end of the inlet cam shaft, and the commutator on the forward end of the shaft which operates the exhaust valves. The main clutch has already been referred to by us, and is of a type which resembles an ordinary band brake. It is connected with the change-speed gear through a universal coupling. The gear box is, at its forward end, secured to the frame by two projecting feet resting on the main frame, and at the back to a cross member. It encloses two parallel shafts mounted in the same horizontal plane, both of them being connected by bevel gearing with the differential gear on the countershaft, as in the Mors and Ader models. Four forward speeds and a reverse are provided. The counter-shaft is rendered flexible by couplings introduced between the differential gear and the outside ball bearings which support it. The side brakes are of the expanding type, and are compensated; the details of their construction are very neat, the strain imposed upon them when in use being transmitted directly to the distance rod which connects the back axle with the frame, which serves to tighten the chain. This 20-h.p. chassis is shown in two of our illustrations.

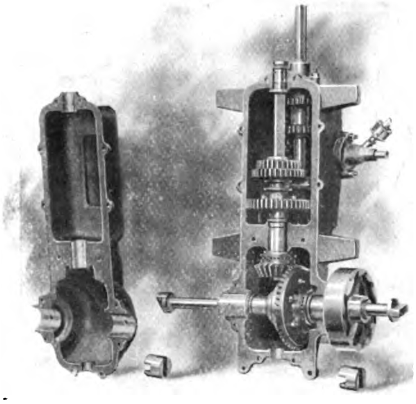
The company's large 40-h.p. 8-cylinder engine, which was one of the attractive "sensations" of the Exhibition, is shown in another photograph which we reproduce. Only the front part of the chassis was shown, the cross section of the square tube, forming the main frame, being thus rendered visible. The engine is fixed direct to the side members of the frame by six feet. Two carburettors are used for it, one for each four cylinders. The exhaust gases from each four are also led away by a single pipe-connection passing across the ports, through which the exhaust gases find their way out from the cylinders. As we have before stated, the intention is to dispense with any form of change-speed gearing, which, of course, it would be quite possible to do provided that the relative speed of the engine and the driving wheels is such as to allow the former to take the car when fully loaded up the steepest inclines it is likely to encounter. This, however, could be accomplished with a 4 or even a 2-cylinder motor if the power relatively to the weight were sufficient. Doubtless a more uniform "torque" would be obtained with multiplicity of cylinders, but the difficulties of synchronising are great.

The Gladiator Company made a very interesting show with their new models for 1903, these comprising the single-cylinder 6-h.p. car, the 10-h.p., with twin-cylinder engine, and the new 12-h.p. carriage, with an engine having four cylinders. The finished cars have a much more imposing appearance than previously, and although no really radical change of design has been made, yet there are many important differences between the old and the new models, apart from the introduction of the 4-cylinder carriage. The chassis of the 12-h.p. car is shown in plan in our illustration. The cylinders are cast in pairs, and the engines and the change speed gear are fixed to an underframe of angle section, which is rigidly fixed to the wood and flitch main frame. A radiator of the honeycomb type, with a belt-driven fan immediately behind it, forms the front part of the bonnet. The engine is very neatly designed, and is well finished. The inlet valves are operated atmospherically, and the speed of the motor is automatically controlled by a centrifugal governor, which is inclosed in a casing in front of the crank shaft, the governor being connected with a throttle-valve and accelerated for the purpose. The time of ignition and the accelerator are adjusted by neat little levers on the dashboard. The wires passing to the high-tension ignition plugs are led in a casing across the heads of the cylinders. The carburettor is on the right-hand side of the engine, and the throttle-valve on the left. The commutator is on the front end of the cam shaft, and the circulating pump is driven by friction off the flywheel.

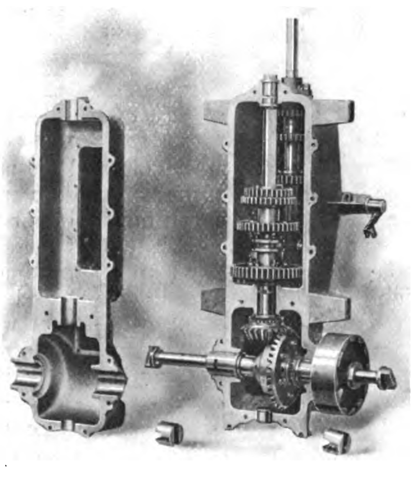


The 4-cylinder Gladiator Chassis.

The motor is brought into engagement with the change-speed gear by a cone clutch of the internal type. The change-speed gear on the car provides four forward speeds and a reverse; the first and second motion shafts are set one above the other, as in the Napier cars. The transmission is by side chains from the countershaft to the rear wheels, and flexible couplings are inserted in each side of the countershaft. The gear box, with its cover removed, is shown in one of our illustrations. The brake on the countershaft is of the metal to metal pattern, and the usual side brakes are fitted to the hubs of each driving wheel. A ratchet and pawl replaces the usual sprag, and can be brought into play from the driver's seat. The bearings in the gear box and those on the countershaft are all lubricated from a pressure greaser on the dash. The ignition coils also are fitted to the dashboard. No levers are attached to the steering pillar. On the smaller cars the three-speed gear with reverse, which is also illustrated by us, is employed, and in this design, also, it will be noticed that the shafts are arranged somewhat differently to the 1902 Gladiators. The 10-h.p. vehicle does not differ materially in other respects from those of last year. The 6-h.p. car is much the same as before, but the engine has an automatic governor and some of the minor changes made in the 10-h.p. vehicle have also been applied to this model.



The Gladiator 3-speed and reverse Gear Box.



The Gladiator 4-speed and reverse Gear Box.

THE 1903 ALBION 12-h.p. CAR.

THE Albion Motor Car Company, Limited, of Glasgow, have sent us some particulars, together with a rough line drawing, of a new 12-h p. tonneau car which they are just putting upon the market, and which is constructed with many interesting features of a similar general nature to those which were noticed by us on Continental vehicles at the recent exhibition in Paris. The car is fitted with a twin-cylinder vertical motor beneath the bonnet in front. The cylinders have a bore of 4½ ins., and the stroke is 5 ins. It has mechanically operated inlet valves. and the Company's patent magneto ignition system is employed. An automatic centrifugal governor controls the throttle valve; the mechanism regulates the speed of the motor at any speeds between 250 and 950 revolutions per minute, according to the position in which a hand lever on the steering wheel is set by the driver. For starting the engine, relief cams are provided which reduce the compression in the cylinders.

An important characteristic of the transmission gear is that a special form of spring drive is introduced between the motor and the change-speed gear, the springs absorbing any shock which is otherwise transmitted from the one to the other. Such a spring coupling would appear to be a useful provision on a petrol car, and we are not aware that its absence from the majority of vehicles of this kind can be accounted for by any lack of practical success with it in the past. On chain-driven motor bicycles it has been shown to be essential, on many heavy steam lurries it has been employed successfully for years, and we have seen a few petrol cars with large single-cylinder engines provided with it.

The change-speed gear, which gives three speeds ahead and a reverse, is suspended at three points in order to avoid any twisting of the frame imposing strains on the bearings. The gearing gives a direct through drive, on the top speed, from the engine to the bevel wheel on the countershaft. The gear box and countershaft are lubricated automatically by the revolving parts, the oil being circulated around the bearings continuously. The various gears are all brought into operation by a single side-lever which enables the driver to pass from one speed to another without sliding the gear wheels through any intermediate speed combinations. The power is transmitted from the countershaft to the rear wheels by side chains, the chains being arranged as close to the body as possible.

The foot brake near the gear box is water cooled, and the side brakes are of the block pattern, in which the blocks press against the inner faces of large steel rings fixed to the driving wheels. These brakes are, as usual, controlled by a second lever beside the driver. The wheel base of the car is very long, and the wheels are fitted with solid tyres, although pneumatics can be supplied if desired. The tonneau is, apparently, very roomy, and the car has a fine appearance, so far as we can judge from the drawing sent us.

We understand that a car of this type will be on show at the forthcoming exhibition at the Crystal Palace, and we have no doubt that many of our readers will make a point of examining it there.

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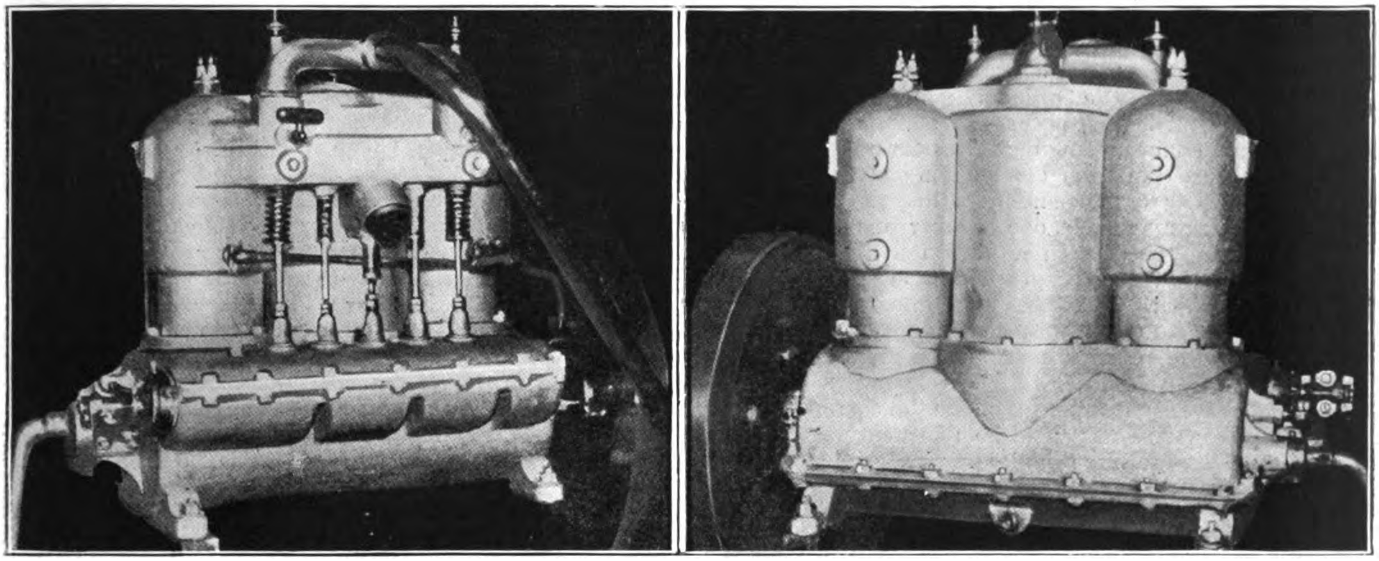
AN alcohol section is to be added to the Brussels Automobile Exhibition taking place at the Palais du Cinquintenaire next February. It will be under Government patronage, and the categories will cover the use of alcohol as a fuel for automobiles and fixed motors.

A COMPOUND PETROL MOTOR.

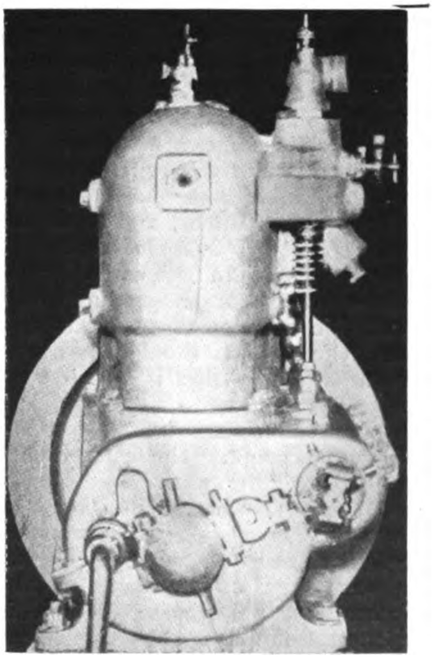
WE have on several occasions referred to the question of compounding a petrol motor in the same manner as is done so successfully in steam engine practice. Although the nature of the burnt gases passing from the cylinder of a petrol motor during the exhaust stroke is very different from that of the exhaust steam from a steam engine, partly because the amount of latent heat in them is considerably less, yet frequent attempts have been made to increase the efficiency and output of internal combustion engines by utilising the exhaust gases in an added low-pressure cylinder. Hitherto, it has been a moot point as to whether the gain of power can be expected to more than overcome the friction and compensate for the cost of the additional moving parts involved, but, if the figures given by an American contemporary (the *Motor World*) are to be relied upon, a new engine which they describe shows that a very considerable increase, both in power and efficiency, can be looked for from such a system. Their description of this machine, which has been made by Messrs. Graham and Fox, of New York, is unfortunately not a model of lucidity, and it is evident that the writer is not completely *au fait* with his subject, but has done his best to write an article from information given to him by the makers. From the illustrations, however, and reading more or less between the lines, we are able to form a fairly clear impression of the engine in question, and propose, with the assistance of the illustrations which we reproduce, to deal with its main characteristics.

The engine has three vertical cylinders which form a single casting, and which are bolted to a closed-in crank chamber in much the usual way. The crank chamber, it will be noticed, is made in two pieces, the joint between the upper and lower portions passing diagonally through the bearings both of the crank shaft and of the cam shaft. The crank chamber is so shaped that it also forms a casing about the half-speed cam shaft, and the cams which operate five exhaust valves. The two outer cylinders are formed with water jackets about their walls and heads. They resemble the cylinders of an ordinary 4-stroke motor, and have valve chambers containing mechanically operated exhaust valves beneath, and atmospherically controlled inlet valves on their upper sides. They work in precisely the usual manner, and the crank pins, driven by their connecting rods, are in line with one another. The cylinders are fitted with ignition plugs of the high tension type, the plugs being screwed into the heads. These high-pressure cylinders have a bore of five inches, and the stroke is also five inches.

The central cylinder, which lies between the two internal-combustion cylinders, is not water jacketed. It has a bore of 7½ inches, and its stroke is the same as the other cylinders. The crank pin to which its connecting rod is



The Graham-Fox Compound Petrol Motor.—View from each side.



End View of Graham-Fox Motor.

attached is set opposite to those operated by the high-pressure cylinders, so that its large piston travels upwards as the smaller pistons descend, and travels downwards as they ascend.

The exhaust gases from each of the outer cylinders pass through two mechanically-operated exhaust valves into the central cylinder during the exhaust strokes of the former, and although no full explanation is given concerning these valves, yet we gather that the whole of the exhaust gases pass through both of them, and that although the valve nearest to the combustion chamber opens and closes at the usual times, yet the valve between it and the low-pressure cylinder opens somewhat earlier, and closes simultaneously with it. We conclude that the second valve is so fitted that the exhaust gases normally tend to open it, whereas the tendency is for the ordinary valve to be closed by them, because it opens against them. The additional intermediate valve, therefore, prevents any gases from being forced back from the low-pressure cylinder into the high-pressure cylinder, without its being necessary for unusually stiff springs to be employed for holding the valves down on their seats.

The exhaust cams and the ignition contact-makers are so set relatively to the crank shaft that the high-pressure cylinders work alternately, one or other of them therefore giving an impulse at each revolution of the crank shaft. The exhaust strokes therefore occur alternately in each cylinder, and their burnt gases pass into the low-pressure cylinder and act upon its piston during each downstroke; the gases expanding in it assist in the propulsion of the crank shaft.

Ample provision is made for allowing the gases to escape finally to the exhaust pipe and to the atmosphere, for not only is the low-pressure cylinder provided with a mechanically-operated exhaust valve, but its piston uncovers a port in the cylinder wall as it nears the end of its working stroke. Some of the gases therefore find their way immediately to the exhaust pipe, and the remainder only are driven out past the valve by the piston. The cam operating the valve has, of course, two projections on it so that the valve is opened at each revolution of the crank shaft.

The following data are given concerning practical tests which have been taken with the motor:—At a speed of 720 revolutions per minute it gave 13·1 b.h.p., this result having been obtained when using it as a compound motor, and in the manner in which it is intended to work. Another test was afterwards made with the low-pressure cylinder cut out, so that only the two high-pressure cylinders were doing work. Under these conditions, and at the same speed as before, the h.p. shown was 8·9. It is stated that the fuel consumption was identical in both cases. We are therefore asked to believe that the low-pressure cylinder when in use does practically the same amount of work as each of the high-pressure cylinders. It should, however, be pointed out that the output of the latter is by no means high for their size, even if the negative work they have to do in moving the parts connected with the low-pressure cylinder is taken into account. The extraordinary statement is then made that "the work done in moving the centre piston was shown by indicator cards to be offset by compression against this piston return stroke. It was negligable, being 1-150-h.p." We must leave our readers to form their own opinions as to what these sentences mean, but we suppose $\frac{1}{150}$-h.p. is intended, though the suggestion that such a calculation was made from indicator cards is somewhat incomprehensible.

We can quite understand that the exhaust gases are rendered much more silent with this engine, and we should have expected their ultimate pressure to be even lower than the 20 to 25 lbs. per square inch mentioned in the article.

The engine is, apparently, well designed, and seems to have been constructed by a responsible concern. It seems that the time of ignition is varied by sliding the cam which operates the contact breaker along the cam shaft, a spiral keyway causing it to advance or retard the time of ignition. The cam is connected with a governor, but whether with the purpose of automatically timing the engine to suit its speed, or in order to control its speed, we are unable to say, for in one part of the article we are led to believe the one, and towards the end of the same page a converse impression is conveyed. The engine should be of considerable interest to automobilists, and we hope that reliable data concerning it may be available in the near future.

The makers are to build cars fitted with these compound engines; they intend constructing two models—the one of 20-h.p. and the other of 45-h.p.

THE Paris Salon closed on Christmas Day, and at the usual banquet which followed over 300 visitors were present. During the evening M. Gustav Rives, the manager of the Exhibition, announced that a profit of about £6,000 had been made on the Show, and that the President of the Republic had that day signed a special decree cancelling all police convictions against automobilists up to December 27th. The figures of the admissions announced by M. Rives for the five Salons held up to the present give some notion of the increasing popularity of the automobile. They are:—for 1898, 81,400 visitors; 1899, 83,700; 1900, 88,900; 1901, 130,600; 1902, 197,454.

Medals and diplomas in connection with the decoration of the stands and the Concours d'Elégance are announced. In the latter competition both Messrs. S. F. Edge, Limited, for their Napier exhibit, and the Wolseley Motor Car Company, for their well-known vehicles, obtain a gold medal, Messrs. Napier and Son also being awarded a bronze medal for the decoration of their stand. The special gold medals offered by various associations are distributed as follows:—Paris Municipal Council, to De Dion-Bouton and Co.; Chambre Syndicale du Cycle and de l'Automobile, to Panhard and Levassor; Chambre Syndicale de l'Automobile, to Darracq and Co.; A.C. de France, to Clément Cycles; Syndicat des Fabricants de Cycles, to Gladiator Cycles. Amongst others who also receive medals for stand decoration we notice the following:—

Silver-gilt.—Gobron-Brillié, Lambert-Prosper, Peugeot, Strom et Fils.

Silver.—Boyer and Co., Charron, Girardot and Voigt, Continental Tyre Company, Falconnet-Perrodeaud, Mutel, Georges Richard.

Bronze.—Belgica, Chenard and Walcker, Delahaye, De Dietrich, Gillet-Forest, Herald, Humber (Cycles), Kriéger, Mercedes, Pascal, Prunel, Rochet-Schneider.

In the Concour d'Elégance the special gold medals are awarded as follows:—A.C. de France, to Girardot, Charron, and Voigt; Chambre Syndicale Automobile, to Mors; Executive Committee medal, to Panhard and Levassor. Other medals include:—

Gold.—De Dion-Bouton, Delahaye, Gobron-Brillié, Société Daimler, Pipe, Georges-Richard, Rochet-Schneider, De Dietrich, Peugeot.

Silver.—Darracq, Herald, Decauville, Rochet, Gladiator, Ader.

Bronze.—Gillet-Forest, Boyer, Fiat, Bardon, Belgica.

Gardner-Serpollet receive the Chambre Syndicale's diploma of honour for steam vehicles, Chaboche obtains the silver medal, and the Locomobile the bronze.

AERONAUTICAL COMPETITION.

THE rules and regulations governing the Aeronautical Competition which will be held in connection with the St. Louis Universal Exposition, 1904, have been drawn up with sufficient severity to more than entitle any successful competitor to even the grand prize offered of £20,000. Altogether £40,000 are allocated for this competition, of which, £30,000 will be given in prizes.

For the grand prize of £20,000 applicants must give satisfactory evidence of having, at some time, made a flight of at least a mile course and return with a machine similar in principle to that proposed to be entered for the competition. The jury may refuse to accept any machines deemed too hazardous to life. An entrance fee of £50 will be required, which will be refunded upon the space being occupied with an apparatus conforming to the rules. The best average speed will govern the award, provided the competitor has made the entire course three times at an average speed of not less than twenty miles per hour each time.

Four minor prizes, amounting together to £2,000, will be awarded in order of speed to the four competitors coming nearest to the record of the winner of the Grand Prize, provided each shall have made the full course three times at an average speed each time of at least 10 miles an hour.

The course will be shaped like the letter "L" (*see* Fig. 1), and will be marked by three captive balloons (A1, A2, and A3). The starting point will be at B, the aeronaut having the choice of the direction in which to start, but he must travel round the captive balloons, A2 and A3, in opposite directions, that is one to the right and the other to the left. The length of the entire course will be not less than 10 miles nor exceed 15 miles. Competitors may make as many trials as they choose within prescribed dates, and the time occupied shall be reckoned from the time the air-ship starts free of the ground until the car again touches the earth within a radius of 50 yards from the starting point. The average speed will be computed for the actual airline distance over the ground, no allowance being made for the wind or for deviations from straight lines to or from the captive balloons. Competitive flights must take place between 1st June and 30th September, 1904, each competitor making at least one trial in each of the weeks determined on by the International Jury. He may, however, choose his own day or days, so long as he announces his selection to the Judges before midnight on the previous day. In the unlikely event of a tie on 30th September, the Jury can prescribe a further trial or trials. The successful competitor must subsequently give three exhibition flights after 30th September, but these flights will not affect the award in any way.

The second competition is for air-ships not carrying an operator and gliding machines. Prizes are offered in these for a flying machine making a straightaway run of one mile and return to approximately the starting point in the shortest time of actual flight. In addition to the weight of the complete machine it must carry an extra dead load of 10 lbs.

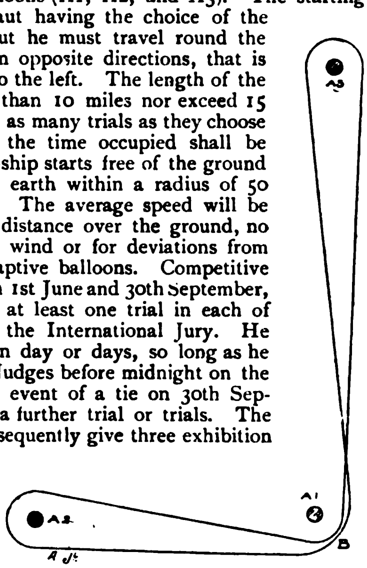


FIG. 1.

The Judges will establish two parallel base lines, one fourth of a mile long and at least one mile apart. These lines will be laid out on the day of the trial and with reference to the prevailing wind, if any. The machine will be started from the centre of the leeward base line and at right angles to it, and shall proceed against the wind. It shall cross the other base line before landing, and may then be caught and started back from the centre of the windward base line, proceeding down the wind and crossing the leeward base line, practically as indicated by the diagram herewith (Fig. 2). The Judges may, in their opinion, order that the competition for this prize shall be made in a calm.

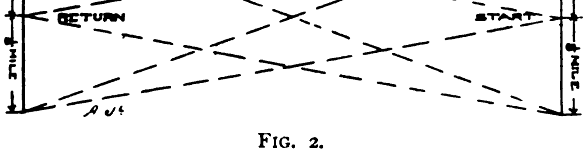


FIG. 2.

Motors for Air-ships or Dirigible Balloons.—A prize of £500 and a second of £200 are offered for air-ship motors other than the actual machine winning the Grand Prize, having the least weight and greatest efficiency in proportion to their power. Motors must have a minimum capacity of 1 b.h.p. and a maximum of 100 b.h.p. The weight of the motor is to include tanks, water, &c., and fuel or its equivalent for a run of one hour. The first test will cover one hour's run to determine power, and the second test a ten hours' run for ascertaining the reliability and durability of the apparatus.

A prize of £400 will be given for a successful attempt to drive an air-ship motor by energy transmitted through space, either in the form of electric radiation or some other form of electrical energy, to an actual amount of one tenth of a horse power at the point of reception, and at a distance of at least 1,000 feet.

Balloon and air-ship tests open to aeronautical vehicles of any type, carrying at least one person, receive four prizes of £1,000 each, as follows:—A. For the greatest altitude attained; B. For the longest time in the air; C. For landing nearest to the Washington Monument in Washington; D. For the longest distance travelled in one flight in any direction. In each case the start will be from the Exposition grounds. In regard to the race to Washington each contestant may make as many subsequent trials as he may choose prior to 1st November. An entrance fee of £50 is payable, to be returned upon the competitor occupying his space ready for the competition.

A series of kite competitions have also a number of prizes allotted to them.

THE METRIC SYSTEM.

PROGRESS continues to be made towards the adoption throughout the Empire of the Metric System of Weights and Measures, one of the last acts of the Conference of Colonial Premiers having been the passing of a resolution in favour of the proposed reform; and there are now 292 Members of Parliament pledged to support a Bill in the House of Commons.

A Select Committee of the House which sat in 1895 recommended that the metric system be legalised for all purposes, and this was effected by the Act of 1897. That Committee also urged that the use of the system be made compulsory after a lapse of two years, but this was not passed into law. They further recommended that the metrical system of weights and measures be taught in all public elementary schools as a necessary and integral part of arithmetic, and that decimals be introduced at an earlier period of the school curriculum than is the case at present. The Public Control Committee of the London County Council, who have been considering the matter, admit that they do not know what steps have been taken to give effect to the latter recommendation, but they are satisfied that its general adoption would, perhaps, more than anything else, pave the way for the more general use of the metric system in this country.

The revived interest in this important subject has been brought about by the Lord Mayor of Sheffield, through whose initiative the Town Council of that city passed a resolution in favour of the adoption of the metric system throughout the British Empire. Copies of this resolution were forwarded from Sheffield to over 400 Town and County Councils, and many of them have acted on the suggestion, and after passing the resolution have notified the Board of Trade and the Members of Parliament representing their division.

The following is a copy of the resolution referred to:—

"In the opinion of this meeting it is most desirable, in the interests of education and commerce, that the metric system of weights and measures should be made compulsory throughout the British Empire after the lapse of such time as may be necessary for preparing for the change from the present system. That a copy of this resolution be forwarded to the President of the Board of Trade and to local Members of Parliament."

It will be seen, therefore, that a considerable amount of pressure is now being brought to bear upon our Government.

In the United States also the movement is spreading. There appears to be every prospect of a Bill being passed at the next Session of Congress, by which the use of metric weights and measures will be rendered compulsory in all the State Departments at Washington (other than those which deal with the survey of land), to be followed later by the general adoption of the system throughout the country.

* * *

THE Electrical Power Storage Company, Limited, in their usual practical way, remind us of the start of a new year by sending us their admirable office desk blotting-pad and calendar, embodying, as before, a £500 insurance policy for the year.

REVIEWS OF BOOKS.

"The House Annual, 1902." Compiled by W. A. Morgan, in aid of *The Referee* Children's Dinner Fund. (Gale and Polden, Limited, Amen Corner, E.C., and Aldershot.)

The Referee Children's Dinner Fund is a most admirable institution. It does an immense amount of good, and is, fortunately, very widely known. The present volume will probably make it more widely known and popular still, and no doubt will fulfil the object with which it has been compiled and published—that of swelling the Fund by its sale. The publication is under the patronage of members of the Stock Exchange, and several of the stories of which the volume mainly consists are by members of the "House" — though some of the contributions are from the pens of well-known writers such as Max Pemberton, Marie Corelli, and G. R. Sims. The illustrations, which are numerous and amusing, form a leading feature of the annual, particularly the humorous sketches by Cecil Aldin and Carruthers Gould, and are alone almost sufficient to ensure its success. The stories are generally in lighter vein, excepting the first one by Marie Corelli, which is rather lugubrious. Incidentally the volume bears witness to the growing importance of the motor car. It forms the subject of "An Automobile Run" by Fred. Burdett, and comes in episodically in Marie Corelli's "Kittums." The gift of prophecy is not needed to enable us to predict that the motor car would not be sympathetically dealt with by Miss Corelli. She introduces it as the adjunct of a distinctly objectionable Jew financier, of whom, by the way, she gives an unexpectedly humorous portrait. The motor car of Mr. Moses was evidently not an up-to-date machine, as it was afflicted with "an irritating cog wheel noise," and emitted "a detestable smell," and was besides "an ungraceful conveyance." "An Automobile Run" is more sympathetic, but we think the author must have been describing his first experience with a motor vehicle. He commenced "steaming well down the Finchley Road," but a breakdown occurs near Hatfield, and then we find out that the machine had a sparking plug, tremblers, and inlet valve, so it wasn't a steam car after all. In a second "panne" in the neighbourhood of Doncaster it ultimately reveals itself as a De Dion, and after the whole machine had been overhauled the trouble is located in the sparking plug. When you cannot see immediately what is wrong with a De Dion, we would recommend testing the sparking plug *first*, and not last, as the author suggests. After this trouble was put right, the De Dion *steamed* on again, till it ran out of petrol, whereupon the travellers made the amazing discovery that they could succeed in running quite as well on benzoline, which they got from a chemist, and so they safely reached their journey's end. It really would be better that automobile stories should be written with a little more exact knowledge, but otherwise the tale is readable and rather amusing. The golfer is catered for in two articles on "London Golf" and the "Haskell Ball," by Horace Hutchinson and Horace Castle, respectively. The latter is highly technical. As a sample of modern golf jargon we cannot refrain from quoting the following:—"The Haskell will certainly take a little negotiation, but on such a course the driving and the long game will benefit by the length of run. As regards a putting ball, I ask is there any such thing? If a put is hit properly does it matter what ball is used?" This shows what latent possibilities English possesses. It is all right, of course, when you know the game, but our readers are probably thankful that, compared with "golf," "motorese" is a simple and easy language. It will be seen that, in addition to the pure fiction, two different sports are thus catered for in the *House Annual*. The work is exceedingly well got up, as already pointed out, is well and originally illustrated, has an attractive appearance, and is just the kind of book to place on a drawing-room table. It will make an excellent substitute for some of the Christmas numbers of the magazines, and purchasers will have the satisfaction of knowing that they are helping a deserving and justly popular charity. We wish it every success.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

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THREE-CYLINDER CARS.

To the Editor of The Automotor Journal.

Sir,—We notice Mr. Maudsley Brooke's letter in your last issue concerning the above, and whilst congratulating him upon having adopted the three-cylinder motor before the Panhard firm, would gently suggest that in this case both France and England have been copying America, seeing that our factory has been regularly making three-cylinder cars since 1897. We would also like to point out that although our cars were not manufactured in England we were advertising them in this country in 1901, and we believe, although we had a car running here in that month, Messrs. Brooke's first public appearance was contemporaneous with our own and that of the Maudsley Company—another English firm to whom some credit is due—viz., the April show of the Automobile Club. Besides, so far as England only is concerned, we remember to have seen illustrations in the public Press some two or three years ago of a three-cylinder car produced by one Dawson, of Canterbury. *Palmam qui meruit ferat*, if you please.

The Duryea Company.

Coventry, December 27th, 1902.

THREE-CYLINDER MOTORS.

To the Editor of The Automotor Journal.

Sir,—It appears, from your issue of the 27th, that the fallacy of a three-cranked engine being balanced for inertia is dying hard. It would be a pity for the automotor industry if such a retrograde movement as the substitution of three-crank for four-crank motors were to take place, but such a movement is unlikely, as it is well known that the ideal motor for easy riding, entailing absence of vibration, is one in which the inertia forces and couples can be balanced. Now, in a four-cranked motor, the inertia forces, vertical and horizontal, of the first and second order can be balanced, and the couples of the first order also can be balanced, leaving not much to be desired in the way of inertia balancing.

Engineers well know that a three-cranked engine can be balanced either for forces or couples, but not for both; but which is the worst offender in the way of producing vibration is a matter for argument, the probabilities being that the difference is not great.

It would doubtless astonish some of the builders of three-crank motors, having equal pitched cranks, if they worked out the couples tending to tilt the engine or otherwise rock the car. The couples produced in the three-crank motor would be found to be greater than those produced in a two-crank motor, having moving parts of equal weight. Thanking you in anticipation,

I am, Sir, yours faithfully,

B. A. Lance.

The following firms have been elected members of the Society of Motor Manufacturers and Traders, Limited, viz.:—Albany Manufacturing Company, Limited; Automotor Accessories Company, Limited; Haynes and Son, Limited; Oldsmobile Company of Great Britain, Limited; Sirdar Rubber Company, Limited. The next dinner of the Society will take place on 14th January, at the Hotel Cecil, at 7 p.m.

DOINGS OF PUBLIC COMPANIES.

Progress Cycle Company (Limited).—The annual meeting of this company was held at Coventry on Tuesday last, Mr. W. E. Dalton presiding. The Chairman announced that, following the failure to carry the reconstruction scheme, the directors had arranged for a debenture issue of £6,000 to enable the company to develop the motor branch of the business. A shareholder opposed the debenture issue, but found no seconder, and the report was adopted.

Motor Traction Company (Limited).—A meeting of the Motor Traction Company was held on Monday last, when the following resolution was to be submitted:—"That the liquidator be at liberty to sell any shares not so claimed (*i.e.*, under the scheme), and to apply the net proceeds towards the expense of liquidation and of carrying the said scheme and agreement into effect." This, it was claimed, would result in shareholders who did not desire to find another 30s. a share being deprived absolutely of all interest in the assets created with their money, and, with a view of opposing the proposal, a committee, including Messrs. P. Mason, J. A. Bartrum, G. Lacy Hillier, and Colonel Holden, issued a circular and secured a very large response from the shareholders in the shape of proxies and promises of support. As a result of this, the Chairman of the Board (Mr. E. Underwood), on opening the meeting, announced that the resolutions would be withdrawn, and that the Board would not proceed on the resolution of sale to the new company carried at the previous meeting. On the proposition of Mr. Munton, of Messrs. Munton and Morris, a committee of investigation was appointed, which will report to the shareholders at a subsequent meeting.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

J. A. Wilding and Co. (Limited), 3, Wilson Street, Drury Lane, W.C. Capital, £15,000 in £1 shares. Object, to adopt an agreement with J. A. Wilding, F. C. Haste, E. A. Nesbitt, and C. W. Milne for the acquisition (inter alia) of the business of J. A. Wilding and Co., and to carry on the business of manufacturers, repairers, and vendors of motor cars, motor lurries, motor vans, motor cycles, and other vehicles and cycles, &c. The first directors are C. W. Milne, J. A. Wilding, F. C. Haste, and E. A. Nesbitt.

Motor Car Insurance Company (Limited).—Capital £100, in £1 shares, with objects as indicated by the title.

BANKRUPTCY COURT.

L. H. J. G. Greig.—The first meeting of creditors of this debtor was held last week at the London Bankruptcy Court. The bankrupt was lately accountant to the Carnegie Steel Company, and now serving a sentence of five years in Lewes Gaol for forgery. Proofs were tendered to the amount of £5,295. It appeared that the debtor had been in business as a photographer, stamp merchant and accountant. In 1897 he was appointed an accountant to the Carnegie Steel Company, and held the post until his arrest last September. Since 1900 the debtor had been interested in various patents and inventions. He provided £5,000 for the Graydon Turbine Engine, and acquired a one-third share in the property. He also became entitled to a one-fourth interest in the Graydon Patent Projector. Then he held a one-third interest in Barbers Patent Motor Car, in which concern he had invested £500; and a four-fifths share in the Kingston Motor and Cycle Company, for which he had provided £1,000. The debtor had further stated that he found the funds with which to start the Motor Express Company and the Kingston Motor Express Company, in which concern he had sunk about £5,000, most of the money coming from the Carnegie Steel Company. He was the sole proprietor of the *North London Observer*, and he had a one-third interest in the *London Mining Monthly*. In the beginning of the present year he entered into a contract for the building of a motor boat for £200. He had paid close upon £400 in connection with the boat, which was to be his own property, and if it proved successful he was to have a share in a syndicate to be formed for exploiting the patent. He had entered into an agreement to purchase the business and works of George Mann and Co., of Leeds, and had paid a deposit of £1,500. He was also interested in two stockbroking businesses. The debtor estimated his unsecured debts at £3,000, and had in the shape of assets his interest in the before-mentioned companies and patents, a small balance at the bank, six motors at Kingston (valued at £300) and book debts £100. He attributed his failure to his arrest and conviction, by reason of which he was unable to carry through the various undertakings in which he was interested.

The Paris-Madrid race over the Spanish portion of the route has been formally authorised by the King of Spain.

THE German Automobile Club has made formal entry with the British Club to run in the Gordon-Bennett Cup Race this year. Three Daimler cars will compete, Count Adalbert von Sierstorpff representing the German Club.

Now the plunge has been taken by the A.C. of America of making formal entry for the Gordon-Bennett Cup, candidates desirous of representing America in the contest are as plentiful as the leaves in Vallombrosa. In addition to Alexander Winton and Percy Owen on Winton cars, and H. S. Harkness on a "Peerless," Windsor T. White is coming forward with a specially designed steam car, L. P. Mooers, of Cleveland, and W. K. Vanderbilt, jun., also being anxious to be amongst the number to receive nominations.

FRENCH automobilists are taking it for granted that the British authorities are so unpatriotic as to refuse consent to the Gordon-Bennett race being run in this country. So they are already suggesting the race should be held between Paris and Bordeaux on the first day of the Paris-Madrid race in May. The importance of the race on the industry of the country in which it is held is evidenced by the almost feverish anxiety of the French to force the English holders of the Cup into taking advantage of the rule providing for its being held on French soil in the event of sanction being refused by the country holding the Cup. The refusal of the A.C. de France to relax the rule as to the minimum distance over which the race is to be run is hardly in keeping with the sportsmanlike spirit displayed by the British Club, when, last year, consent was asked to run the race in stages, and although the refusal may render it more difficult for a suitable course to be selected in Ireland, we fancy a course *will* be found by Secretary Johnson, with the assistance of Colonel Knox, Mr. Mecredy, and others. It will then remain to be seen if Parliament will play into the hands of our Gallic neighbours by throwing out the necessary Parliamentary measure which will be introduced to enable the race to be run in the United Kingdom. Such action would expose the Government to the just indignation of the manufacturers engaged in this rapidly-growing industry, and would make a black and shameful mark in our Parliamentary annals.

EXHAUST BOX COMPETITION.—The rules governing this competition organised by the A.C. de France have been issued. As already announced, it will take place at the A.C.F. laboratory, and will start on March 1st. Each apparatus will be tested on the same motor, which will be a single cylinder of 140 mm. bore and 160 mm. stroke. The compression will be 4 kilogs. per square cm., and the speed such that there will be from 400 to 500 exhaust strokes per minute. Care will be taken to ensure a constant explosive mixture. After an elimination trial, the selected appliances will be mounted two by two on the exhaust pipe, and tried alternately. In addition to the suppression of noise, the Committee will take note of the back pressure produced, the size and weight of the apparatus, smell, the presence of smoke, simplicity and cost of construction. The entrance fee is 20 francs up to February 15th.

THE third annual Consumption Trial organised by *L'Auto-Vélo* is to be held on February 19th, over a 100-kilom. course. Three Gillet-Forest cars are entered by way of a start. Some innovations in the regulations governing the trial are promised.

ALREADY three Bruneau machines have been entered for the Critérium du Quart de Litre, confined to motor bicycles, which, originally announced for February, is postponed until the beginning of March. It will take place at the Parc des Princes, Paris, over a distance of 100 kiloms. No pedalling will be allowed, and the maximum size of the cylinder permitted will be 250 cubic cms. All motors will be weighed and measured before starting and the five first cars will be re-measured after the trial. The event will probably be run in heats.

Two shows only per annum have been decided upon by the American National Association of Automobile Manufacturers, viz., the Madison Square Garden Show, New York, and the Coliseum Exhibition, at Chicago. For the former, which opens on the 16th inst., 120 exhibitors have secured every available inch of room, the list including all the best-known makers and agents throughout the States.

THE official report of the A.C. of America 500 Miles Reliability Test has been issued in advance sheet form. It consists of 112 pages, and deals very fully with the contest from first to last, opening with an introduction and general observations, recommendations for future contests, a detailed account of the performance of each car, giving the causes of stops, speed averages, list of awards, certificates, &c. The chief difficulties with the petrol cars appear to have been ignition, this trouble accounting for 26 per cent. of the marks lost by the 43 cars having stops debited to them. Water circulation comes next with 11 per cent., whilst tyres and valves each account for 10 per cent. In steam cars, for 16 having stops deducted, water and petrol are accountable for 75 per cent. of the stops, and tyres for 9 per cent. The officers signing the report — Messrs. W. E. Scarritt, G. F. Chamberlain, and J. A. Hill — by way of conclusion "congratulate the board of governors on the excellent showing made by cars of American manufacture, and believe that the day is not far distant when the signet 'Made in America' will stand for all that is highest and best in automobile construction throughout the world." Very full particulars are given for each car, and the official causes for withdrawal of the seven cars which retired are:— B6 (Foster), broken crank shaft; B14 (Autocar), damaged gear shaft; B15 (Ward-Leonard), jaw couplings between engine and speed gear broken, crank shaft bent; C50 (Neftel), defective water circulation, hot engine; A54 (De Dion-Bouton), broken steering gear; B69 (Fredonia), damaged transmission gear; A74 (Buffalo), broken connecting rod. For next year the committee suggest the advisability of holding a separate tyre test, distinct from the reliability trial itself.

THE opinion of the Judges quoted above hardly coincides with the opinion of the *New York Herald* when criticising the exhibits to be staged at the forthcoming Madison Square Show. According to the *Herald* the American car manufacturers are now where they should have been three years ago, and they are at least two years behind the progress shown at the recent Paris Salon, whilst in the heavy class there is nothing *even* up to the British manufacture as shown in Paris.

THE annual general meeting of the Automobile Club will be held on February 27th.

JANUARY 24th is the date appointed for the next quarterly 100 miles trial of the A.C.G.B.I.

IN a recent article on "Expenses in Sport" in the *Daily Telegraph*, curiously mention of the motor car is altogether omitted.

M. MICHELIN has given notice that next week he will publish the names of the British agents where Michelin tyres for 1903 can be procured.

Two thousand two hundred and eighty-seven is now the total membership of the A.C.G.B.I., showing an increase of 1,084 during the year 1902.

"WESTON MOTORS" have changed their name from the 1st inst. to "The Western Motor Syndicate," the address, however, remaining as before at 14, Mortimer Street, W. Only the name is changed in connection with the business.

WEST END jewellers are credited with bemoaning the absence of the usual Christmas trade, due, they assert, to the fashionable motor car, which has led many gentlemen, who would have spent £1,000 on a piece of jewellery, to present their wives with a motor car.

A HANDY little calendar note-book in a leather cover is to hand from the Continental Caoutchouc and Gutta-Percha Company, 64 and 65, Holborn Viaduct, manufacturers of the Continental Clipper Tyre. A compact speed table, giving times for average speeds from 12 to 100 miles per hour, appears in the front part.

A NOT untimely warning is given by the Wolseley Motor Company to guard against, during cold and frosty weather, the danger of water in the cylinder jacket and radiators freezing during the night or when the car is stabled. The best method for avoiding this danger in the Wolseley cars is set forth in a small red "caution" slip issued by the Company.

THE newly-formed Nottingham Motor Cycle Club is making rapid progress. Mr. F. Garratt has been appointed Captain, Mr. E. G. Young, Hon. Sec. and Treasurer, the members of the Committee being Messrs. W. E. Stevens, W. E. Brough, H. H. Monks, F. Mitchell, and J. Sewell. An inauguration dinner and the opening of the Club are to take place early this month.

MR. W. E. MOSS has accepted the hon. secretaryship of the Liverpool Self-Propelled Traffic Association, in succession to Mr. Shrapnell Smith, who resigned some few months ago. Mr. Moss is a partner in the firm of Messrs. Davies, Benachi, and Co., cotton merchants, Liverpool, and a son of Mr. W. R. Moss, senior partner in the firm of Crosses and Winkworth, Limited, cotton spinners, Bolton. He was educated at Rugby School and Trinity College, Oxford.

Under which thimble is the pea?—At a small shop in the West End there is a Spaniard selling miniature automobile omnibuses with the inscriptions "Kensington," "Putney," &c.—of course, in English. The maker's name is that of an American firm, and underneath, "Made in Germany"! The show-card says, "Latest Parisian novelty"!

Both the Anglo-American Oil Company and Messrs. Carless, Capel, and Leonard, in order not to be prevented supplying petrol to their customers by the recent arbitrary action of the railway companies, who, although they have made some slight concessions, have refused to withdraw Clause 2 in the Consignment Note, have decided to sign the consignment notes under protest, reserving to themselves the right of taking further action. They are sending out a circular to this effect to their customers, who will, therefore, be able to obtain their supplies as hitherto.

The motor car, in a more or less prominent rôle, has been introduced this year into practically every pantomime throughout the United Kingdom, headed by "Mother Goose," at Drury Lane Theatre, the premier pantomime of England. Needless to say the subject in every instance has been treated from a harmlessly ridiculous point of view. The interpretation of the law by the Drury Lane "police," that it is illegal to drive a car or ride a bicycle at a speed above or below 12 miles an hour, is provocative of much boisterous fooling.

We are informed that the voluntary liquidation of the Motor Car Company, Limited, has now been closed, and that from January 1st, 1903, the business of the Company will be carried on upon a reconstructed basis. Mr. R. Moffat Ford, who resigned office previous to the liquidation, has again been asked to join the Board, and has been offered the position of Managing Director, which he has accepted. The business of the Company during 1903 will consist solely of the sale and repair of Decauville cars and of the representation of the Société Decauville of Paris in the United Kingdom.

We are glad to hail the appearance in the *The Times* for Wednesday last, of the first of a series of descriptive articles dealing with the Paris Motor Car Exhibition. Their appearance is interesting evidence of the interest which the great daily is now taking in the movement, and though they are from "an engineering correspondent," they are not too technical for the general reader. We would point out, however, that the writer rather mixes up the various types of steam car, attributing disadvantages to them all, such as excessive water consumption and danger of furring the boiler, which, at any rate, do not apply to the Serpollet and White vehicles.

Great success attended the paper chase on Boxing Day of the Yorkshire Automobile Club. There were two "hares," represented by a 10-h.p. Daimler (Mr. and Mrs. Jackson and Mr. Hey), and a 12-h.p. Gladiator (Mr. Kirk). The pack of "hounds" was made up of a 9-h.p. Clément (Mr. Faiers), 8-h.p. Loidis (Mr. A. W. Dougill), 4½-h.p. De Dion (Mr. and Mrs. Walker), 8-h.p. Korti (Mr. and Miss Armitage), an Oldsmobile (Mr. Albert Farnell), a Pieper (H. A. Jones), two motor bicycles, ridden by Mr. Owen Brookes and Mr. Chippendale, and a motor tricycle carrying Mr. H. Hey. A start was made punctually at 12 o'clock, the trail being through Otley, Denton Park, Ilkley, Addingham, Skipton, on to Grassington. The "hares" were laid by the heels by Mr. Faiers (9-h.p. Clément car) at Cracoe, the other side of Skipton, Mr. Chippendale being also in at the death on his motor bicycle. A return was then made *viâ* Pateley Bridge and Blubberhouses to the Prince of Wales Hotel, Harrogate, where the famished hunters and hunted sat down together to a substantial tea.

In another paragraph we comment in our present issue, and have frequently commented on other occasions, on the manner in which the existing law is, with few exceptions, administered to the disadvantage of the automobile movement. A monstrous example of this kind of prejudiced discrimination is afforded by the case of Mr. Campbell Muir, who was, on Tuesday, convicted by Mr. Denman, at Marlborough Street, and fined 40s. for leaving his motor car in Dover Street, outside the Bath Club, from ten minutes past one till two o'clock. There is no doubt of the legality of the magistrate's decision. Mr. Campbell Muir, in a letter to the *Daily Mail*, seems to think that in such cases the obstruction must be proved. Unfortunately it is one of those instances in which the prohibition is an absolute one, as the lawyers call it, and proof of the obstruction is not needed. The absurdity of the situation, however, is that the motor car was doing no earthly harm in Dover Street, one of the quietest and most secluded thoroughfares in the Metropolis, and that if a carriage and pair of horses had been standing there for fifty hours, instead of fifty minutes, the constable would probably have taken no notice whatever of it, except perhaps to chat with the coachman and obsequiously touch his hat when the owner appeared. This is the kind of want of discretion in the administration of the law of which we complain. It can but have one object, and it has but one object, that of attempting to cripple and injure a growing industry which has benefited the country largely already, and will benefit it vastly more in the future. It is so intensely silly, this exercise of petty spite against a thing simply because it is new. It is beyond the reach of argument. The proper weapons for dealing with it are derision and contempt. We protest also against the frequent habit of magistrates of delivering lectures, particularly to automobilists, on all sorts of subjects (including ethics) which they do not understand. The magistrate's seat is not a lecturer's chair.

The first experimental section of steel road in New York City has been laid under the supervision of the A.C. of America, after three and a half weeks' work. The exact position being on Murray Street from Broadway to Church Street, a distance of 440 feet. The foot-wide steel rails used were presented by President Schwab, of the Steel Trust, for the purpose of testing their value for heavy traffic. As far as can be observed, the rails with their very slight ridges on the outside in no way interfere with either horses or trucks—wagon drivers pass over them and pull out diagonally without even noticing that the rails are there. In instances where they have been noticed, the driver has taken much trouble to keep clear of the rail, probably for fear he might damage it, being ignorant of the purpose for which it has been provided. Formal tests have been made with a heavily-loaded cart, and by way of comparison the same cart was drawn over the stone pavement. The cart, weighing nearly 2 tons, was hauled by ten men up the 5 per cent. gradient of the street laid with steel, and a spring balance attached to the hauling-rope showed that 200 lbs. traction power started the vehicle, while to keep it moving an average of 100 lbs. sufficed. The same test on the Belgian blocks laid in another part of the street showed 500 lbs. traction power insufficient to start, and an average of nearly 200 lbs. was required to keep going. A second section of about a quarter or half a mile is to be laid down in Seventh Avenue. General Stone, of the A.C. of America, who is taking an active part in these experiments, states that the steel roads cost about 4,000 dollars a mile, and are no more expensive than macadam roads.

Automobile Topics (New York) proposes making a daily issue during the New York and Chicago Shows.

THE Long Island (U.S.A.) Automobile Club have removed to 65, Putnam Avenue, the house of the Lincoln Club.

THE American Automobile Association have decided to reduce the subscriptions payable by the membership clubs from three dollars to one dollar per annum per head.

CAN absurdity go further than this? M. Broet, a member of the Automobile Club of France, is said to be building an air-ship containing a room with couch, wardrobe, and table, the whole being windowed with mica.

THE Automobile Clubs of the State of New York are organising a General Association chiefly for the purpose of ensuring combined action in securing favourable legislation for automobilists, dealing with the subject of good roads, and the fixing of signposts throughout the State.

PROF. ALEX. GRAHAM BELL, the famous American electrician, is reported to be constructing an air-ship on somewhat novel lines, the practical utility of which he hopes to demonstrate in the spring. Prof. Myers, of Utica, has, it is stated, just completed an aerial "electric torpedo which flies like a bird."

THE Kansas City aldermen, in the United States, are drawing up speed regulations dividing their township into three speed districts, and giving a range of 6, 10, and 15 miles per hour. The minimum fine for contravention of the speed regulations it is proposed to increase from 1 dollar to 5, the maximum remaining, as heretofore, at 500 dollars.

AUTOMOBILES and heavy traction motor vehicles may be imported into Servia free of import duty for a period of ten years, and at reduced railway charges amounting to 25 per cent. The Servian Government are thus encouraging the introduction of mechanical traction into their country, and are prepared to enter into agreements with manufacturers to this end.

THE automobile has even at last found its way into the desert, a motor wagon constructed by Jesse Ellis and Co. (Limited) to carry some forty soldiers being now regularly employed by the Egyptian Government in the neighbourhood of Abbassieh, where it runs along the Suez road in excellent style, and occasionally makes incursions into the desert, and though in soft places it rather ploughs the sand, it gets on, nevertheless, on the whole satisfactorily, as it is provided with exceptionally broad tyres. Trials have also been made of a desert transport wagon (motor driven) for carrying camels, horses and mules. The neighbouring Arabs are said to be much impressed and also somewhat scared on observing the two machines ploughing their way through the desert sands. The Arabs are not apparently in favour of the new movement, as they dubbed the two machines "the big and little devils."

DR. MACDONALD, the United States criminologist, has recently been issuing a "report" which is calculated to frighten people off modern progress in general, as he attributes the growth of crime, insanity, and suicide to the development of automobiles, electric tramcars, and telephones. There may be something in the telephone, at least as managed in London. We suffer from it ourselves. But as regards automobiles they have been instrumental in restoring lunatics to a condition of sanity. Dr. Macdonald also takes a gloomy view of inventions. He thinks they are conducive to insanity also. That is particularly likely just now, we should say, in the United States, as we learn that a Chicago inventor has formed a company for obtaining electricity from space. He suffers from the delusion that the force of gravity ceases seventeen miles up in the air, and that if he can get a cable up as high as that he can pay it out into space *ad lib.* He also appears to be troubled with the hallucination that space if thus tapped would supply electricity. As this gentleman is said to have been successful in forming a company to work his invention, it is evident that this type of insanity is catching.

NEW INVENTIONS.

Claiming particularly to apply directly or indirectly to Motor Vehicles, &c.

Patent Specifications Published.

Applied for in 1901.

Published January 8th, 1903.

22,872.	W. E. WHITBREAD and R. COOKLING. Motor vehicles.
23,289.	S. DE JONG. Lubricating apparatus.
25,561.	A. HERBERT and P. V. VERNON. Variable speed mechanism
26,229.	H. WHITE. Secondary batteries.
26,331.	F. MITCHELL. Pneumatic tyres.

Applied for in 1902.

Published January 1st, 1903.

84.	E. MATHIEU. Clutch gear.
156.	SOC. ANON. D'ELECTRICITE MORS. Carburettors.
1,361.	W. J. DAVY. Steam engines for automobiles.
7,250.	R. M. HUNTER. Motor road vehicles.
13,6,6.	D. MACDONALD. Driving gear of motor cycles.
20,409.	H. A. KNOX and J. H. JONES. Motor-driven road vehicles.
22,950.	E. S. BOWEN. Sparking mechanism.

Published January 8th, 1903.

187.	T. HAMPSON and others. Motor vehicles.
939.	J. C. HUDSON. Motor vehicles.
1,603.	J. WELLER. Frame for motor bicycles.
4,809	H. CAMPBELL. Internal combustion engines.
16,389.	F. SCHMITT. Illuminating device for motor cars.
18,759.	C. FAURE. Igniting device.
19,423.	J. P. E. LIET. Variable speed mechanism.
22,271.	SOC. ANON. AUTOMOBILES BELGICA. Casings for engines and motors.

THE AUTOMOTOR JOURNAL

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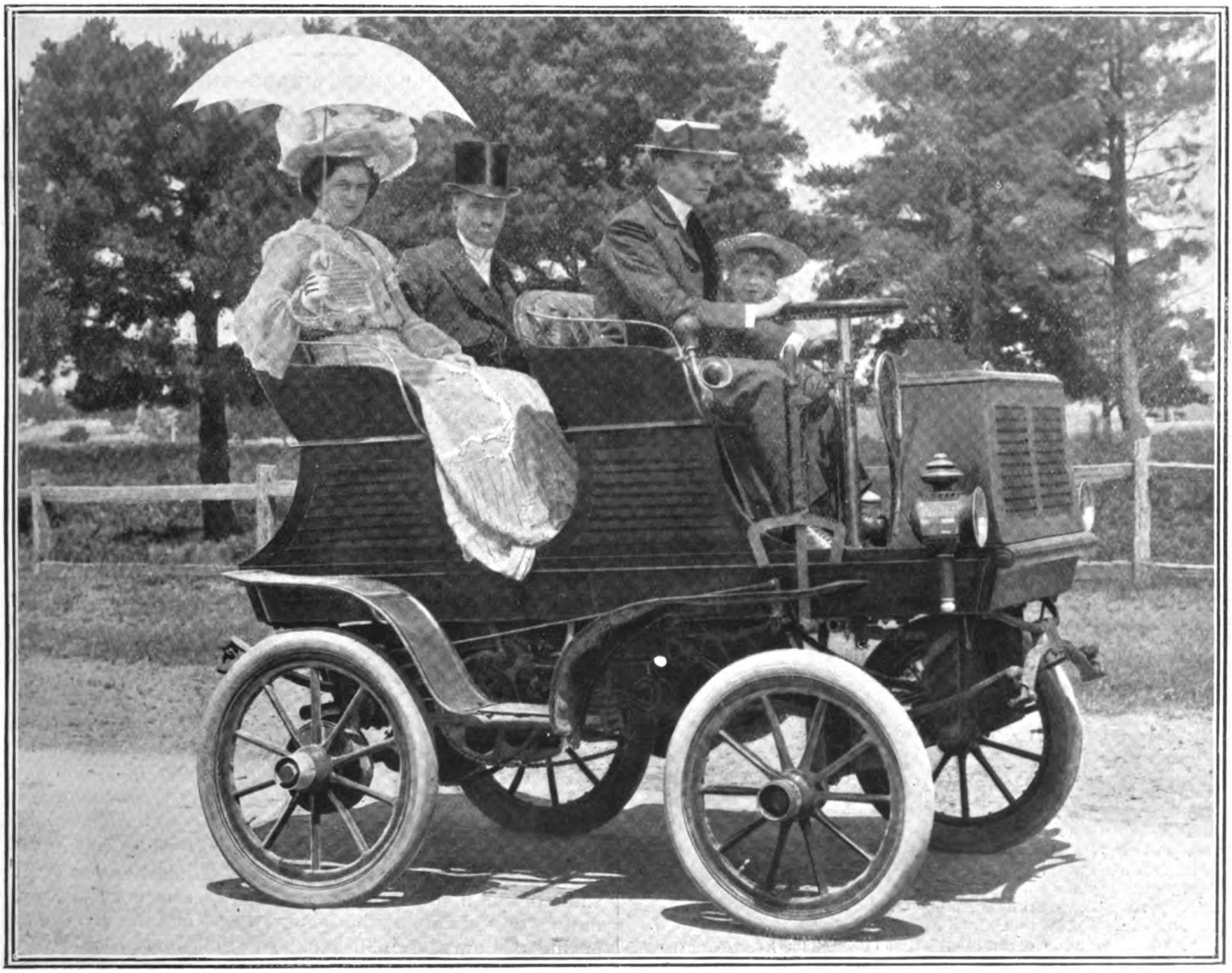

AN AUSTRALIAN "HEAVY OIL" CAR. (*See* page 41).

THE AUTOMOTOR JOURNAL.

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Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.	
September ...	The 1,000 Miles Trial.
1904 ...	Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
Jan. 7–13 ...	Leeds Cycle and Motor Show (The Coliseum).
Jan. 11	Coupes de Pioule.
Jan. 16–24 ...	Stanley Club Motor Show at Earl's Court.
Jan. 30–Feb. 7 ...	Exhibition, Crystal Palace.
Feb. 3–7... ...	Liverpool Cycle and Motor Show.
Feb. 6–14 ...	Edinburgh Motor and Cycle Show.
Feb. 7–16 ...	Brussels Automobile Salon.
Feb. 9	Competition of Timing Apparatus (A. C. de F.).
Feb. 19	Consumption Trials (100 kiloms.) *L'Auto-Velo.*
Feb. 22–28 ...	Pau Automobile Week.
March	Competition of Silencers (A.C. de F.)
March	"Criterium du Quart de Litre" (*L'Auto-Velo*).
March 1–15 ...	Berlin Automobile Exhibition.
March 16–30 ...	Vienna Automobile Exhibition.
March 21–28 ...	Cordingley and Co.'s Exhibition, Agricultural Hall.
March 21–28 ...	"Criterium des Transports Automobiles." 1,095 kiloms. (*La France Automobile*).
March 28–April 5	Nice Automobile Week.
May	Paris–Madrid (A.C. de France).
May	Gordon-Bennett Cup Race.
June 22–24 ...	Automobile Club Fêtes—Paris.
August	Circuit des Ardennes.
Oct. 15–21 ...	Leipzig Exhibition.

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PASSING EVENTS.

THE GORDON-BENNETT RACE—AN OBSTACLE.

OUR French contemporaries have all along been quite decided that there is no chance of the Gordon-Bennett Race being permitted in the British Islands. They do not seem to be quite as sure about this now as they were. At least, we come to this conclusion from the circumstance that they have been at the trouble of discovering an obstacle in the shape of the Irish ass. The Irish donkeys, we are informed, have cultivated the pleasing habit of taking their midday siesta at full length on the high roads. It is a fact that in defiance of the law they are often turned out to graze on the roadside, and donkeys being only human after all, do occasionally, under such circumstances, go to sleep. Of course, a donkey in the land of dreams, and the middle of the road, would be an unpleasant object to encounter at the speed of the Gordon-Bennett Race. The encounter would also be unpleasant in all probability for the donkey. But for this one occasion we think the roads might be barred for donkeys, at any rate for those with four legs. There is an appropriateness in the suggestion that the progress of an industry as typified by the Gordon-Bennett Race should be similarly blocked by somnolent donkeys. We hope the project will not be blocked in "another place." If the Irish donkey be successful in stopping the Gordon-Bennett Race, he will command much sympathy in some parts of England. We would not like to suggest that his characteristic head, suitably emblazoned, should be adopted as arms by any of our County Councils, or adorn a semi castellated residence in the neighbourhood of Worthing, but more inappropriate things have happened before now.

THE MOTOR CAR AS EDUCATOR.

IT was Professor Huxley who used to insist on the great value of the natural education which, in a mechanical way, nature bestows on all her children who are not artificially excluded from her influence. After all, there is no really better education than that afforded by learning the adaptation of means to ends. That is what the Oxford undergraduate learns with pain and trouble from the pages of Aristotle. It has been largely left to the motor car to prove that it can be learned quite as well, and a good deal more quickly, in the workshop of practical experience. The initial lesson is generally given by the side of a car (and sometimes underneath it) on a wet and stormy night, when something goes wrong with its interior economy. If anything *does* happen to a car it invariably occurs in nasty weather. The amateur then finds out how important it is to understand the different parts of his machine and how they fulfil their functions, and soon he takes to executing repairs himself and becomes a being of quite a different scale of intelligence from what he was six months or a year previously. It is when raised on a basis of general cultivation that mechanical knowledge produces its greatest effect. An uneducated mechanic, however clever he may become, remains a mechanic. The man of cultivation and education when he acquires, in addition to his other attainments, a practical knowledge of mechanics, develops mentally to an enormously greater extent. The motor car is producing this educating effect on a large number of cultivated and educated men. We have often insisted on its value in this respect in the past, and we are therefore pleased to see that some of our American contemporaries have been pegging away at the subject also.

THE NEWMARKET CARS.

The motor car has occasionally appeared at election times before now, but it has never had quite such a field day as during the polling for the East Cambridgeshire division at Newmarket. The effect of the automobile was most pronounced, and it appears to have been the most powerful electioneering agent in the constituency. People who had never had a ride in a motor car before made use of the occasion to get one for nothing, and unfortunately we fear very often went to the poll in a car belonging to the supporters of one candidate, and when they got there incontinently voted for the other. That, however, happens with horse-drawn conveyances, too. But one thing the Newmarket election makes clear, and that is that in a country election the candidate who can count on the services of the largest number of motor cars for conveying his supporters to the polling booth will have in future a very important advantage. The man-shifting power of the automobile, too, is very much greater than that of the horse-drawn vehicle. It gets a much greater number of people to a given point in a given time than the latter can possibly do. This, in addition to its growing popularity, makes it a very formidable electioneering weapon. There is something particularly appropriate in this victory of the motor car at Newmarket. If one town more than another has since the days of Charles II. been sacred to the worship of the horse it is Newmarket. In invading Newmarket the motor car has made a stroke of quite Napoleonic strategy. His favourite move was to paralyse the enemy by marching on his capital. The motor car does not desire to paralyse the horse. It merely desires to assert equal rights with him. It could not have done this better than by vindicating its claims in the Hippophilopolis of Cambridgeshire.

KIDNAPPED BY MOTOR.

Really the powers and possibilities of the motor car are becoming serious. We have before had occasion to point out what an excellent conveyance it is in case of an elopement, as nobody really knows the direction the elopers elope in, and parents and guardians can consequently be given the slip in a way impossible by rail. We have now to chronicle an episode from Berlin in which a father, with the assistance of a motor car, successfully kidnapped and carried off his own children. The circumstances were these: the father had been divorced from his wife to whom the custody of the children had been assigned by the Court. The father, in whom the paternal instinct was apparently stronger than that of conjugal fidelity, did not at all appreciate the loss of his progeny, so he carried them off by motor car, and ultimately escaped with them by train. Presumably, the children were not unwilling victims, and mayhap the prospects of a motor car ride made them even less unwilling than they otherwise would have been; but the possibilities suggested by the episode are rather alarming. Presumably, in this country at any rate, the kidnapping father, if he could himself be cornered, would be amenable for contempt of court, but then, perhaps, it might not be easy to catch him. Perhaps in future the Courts will have to take the motor car into consideration when they glibly assign the custody of children in cases of this sort.

RESPONSIVENESS IN METALS.

It may appear a little far-fetched to assume there is a very close connection between the higher physics and the occasional contrary behaviour of a motor car. But the recent researches of Professor Chunder Bose, of Calcutta, may ultimately provide an explanation. Of course it has been known for an immense time that organic tissues are sensitive to chemical and electrical effects, and can have their sensitiveness heightened or diminished. Professor Bose has made the discovery that inorganic materials, notably metals, present very similar phenomena. You can stimulate them, and if you do it the right way they will respond, and you can make them sick or poison them, particularly with a dose of carbonate of soda, and then they will become more or less permanently dead to the world, and refuse to be stimulated any more. Everybody who knows the motor car knows that, whatever may be said by those who do not understand it, it is a creature of moods. Perhaps this mysterious sensitiveness that the Hindoo professor has discovered in metals may explain many of its moods. When a motor works by fits and starts a dose of carbonate of soda may ultimately be found beneficial, since if it really deprives metal of its sensitiveness, it may make it more regular in its action as well. At any rate, it is interesting to find that the line separating organic from inorganic matter is not so sharp a one as used formerly to be supposed.

TERMINOLOGY.

When a new industry comes into existence there is often a certain tendency to confusion of terminology. New expressions are constantly being introduced by engineers and constructors to suit their own requirements, and they are not always used by technical journalists to convey the meaning they were intended to cover. An additional complication comes in when the slight differences between the use of expressions in this country and America are involved. A rather amusing instance was supplied by a Transatlantic contemporary some little time back. Our contemporary criticised—not without justice—the way in which the inaccurate expressions, "two cycle" and "four cycle," are employed.

"Why," it enquires, "'two cycle' and 'four cycle,' as applied to a motor? Why not 'single cycle' and 'two cycle,' as used in England? The questions are by no means new, but are none the less pertinent for that. In the automobile business, where many people of comparatively little learning in mechanical matters have to deal with terms which, until now, have been strange to them, it is desirable that the language used be as nearly descriptive as possible. The terms quoted are ambiguous, to say the least. Why they are used is inexplicable."

"Two cycle" and "four cycle" are of course abbreviations for "two-stroke cycle" and "four-stroke cycle," and doubtless everyone in the States so understands them. They are open to objection, as abbreviations only too often are, but their use is certainly far from "inexplicable." "Single cycle" and "two cycle," which are commended as being in use here are practically unknown on this side of the Atlantic, and can only be understood as abbreviations for "single-revolution cycle," and "two-revolution cycle," respectively. As a matter of fact, of course, the terms "two stroke" and "four stroke" are most usually employed in this country. A cycle is really a recurring series of events in which the objects concerned revert periodically to the same condition relatively to one another as they were in at the commencement of the cycle. In the Otto or "four-stroke" cycle the series begins with intake stroke, followed by compression, working, and exhaust strokes, this series of events being then repeated. This makes a complete cycle of four strokes, and an engine working on this principle is best described as operating on the "four-stroke cycle." In the two-stroke cycle the four operations forming the complete cycle take place in two strokes, and "two-stroke cycle" is therefore a very good and descriptive name. The slight differences between the uses of technical language in this country and the United States are sometimes a source of trouble to English inventors who are prosecuting their own applications for patents in the U.S.A. Patent Office.

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EXHIBITIONS AND BRITISH PROGRESS.

EXHIBITIONS are coming on in a regular flight. In London alone there will be two within a month and another soon after. The first to open will be the Stanley Exhibition at Earl's Court, which to avoid confusion, we shall generally refer to as the Earl's Court Exhibition. This does not promise to be very large. Then there will be the displays at the Crystal Palace, and in March at the Agricultural Hall. The chief value of trade exhibitions is that they show the degree of progress which has been made, and that they are consequently largely instrumental in influencing the directions in which the public place their orders. There is probably no other industry in which they are of greater service to all concerned than the automobile industry. The Paris Exhibition has had the effect of producing a strong feeling in some quarters that Continental manufacturers have left their English competitors far behind, and that this year's foreign models are considerably in advance of those which will be offered by builders in this country. For this reason we feel called upon to give a word of warning to those of our readers who contemplate the purchase of new cars, and we would draw their attention to the fact that no true comparison can be made between the latest Continental and English models until after, at any rate, the Crystal Palace Exhibition has been held. We would also ask them to bear in mind the fact that no less than three distinct shows will be held in London alone, instead of one, as in former years. The plurality of Exhibitions is unfortunate, and may lead to misunderstandings injurious to the English industry unless it is realised that neither show individually can be representative of British practice in the same way that the Paris Salon was representative of automobile construction in France.

The Paris Exhibition undoubtedly proved that French and Belgian manufacturers are displaying a very progressive spirit, and that a large number of excellent companies in those countries have adopted many novel features which are likely to be improvements in the future. Their action has, not unnaturally, excited a good deal of interest amongst British manufacturers and others, who are interested in the business in England. Some express the view that unnecessary complication has merely resulted, and others hold the opinion that the earlier vehicles have practically been rendered out of date. The former view was expressed by Mr. Jarrott in our columns recently, and the opposite line is very strongly advocated by Mr. Sangster this week.

Mr. Sangster is very angry with Mr. Jarrott for being inclined to combat the view that English manufacturers are as much behind as ever, and this mainly because they have not adopted the three principal innovations which, as he rightly says, were most characteristic of this year's Paris Exhibition, viz. (1) pressed steel frames; (2) mechanically operated inlet valves, and (3) honeycomb radiators. There are plenty of other minor novelties, but these are the principal ones. It is not by any means a foregone conclusion that the positively-actuated inlet valve is an unmitigated improvement as at present applied, although we believe that they will ultimately prove superior. The question is at least arguable either way. As regards the frame and radiator questions, they are merely matters of cost. We dealt with these points at length in our first article on the Paris Salon, and with our views on these particular points Mr. Sangster appears in substantial agreement. It is highly encouraging to find a British manufacturer so willing and ready to learn from foreign practice. We certainly have never been slow to emphasise the importance of so doing, but it is quite possible to maintain that position without jumping to the conclusion that the relative position of the British industry is as unsatisfactory as ever, which is Mr. Sangster's opinion. We do not think his premises warrant his conclusion. We agree with him in censuring the tendency which the Press in this country has occasionally displayed towards self-complacency and complete contentment with the existing state of affairs, but it is possible to run away too completely with the other end of the stick, and above all it should be borne in mind that a car which in important features is a radical departure from existing practice requires thorough testing on the road.

The fact of the situation is practically this, that before recommending the cars fitted with these new appliances thoroughly to our readers, we should like to have seen them taking part in some leading events, and running, at any rate, for a reasonable time on the road.

Of course many of the improvements which have been incorporated in the recent French cars have already proved satisfactory on the Mercedes vehicle. Nobody, however, was able to use Ulysses' bow except himself. It does not follow, therefore, that the copyists obtain the same results—at any rate at the first attempt—as the original manufacturers, who have designed, introduced, and practically worked out important features of construction themselves.

THE VELOX 12-H.P. PETROL CAR.

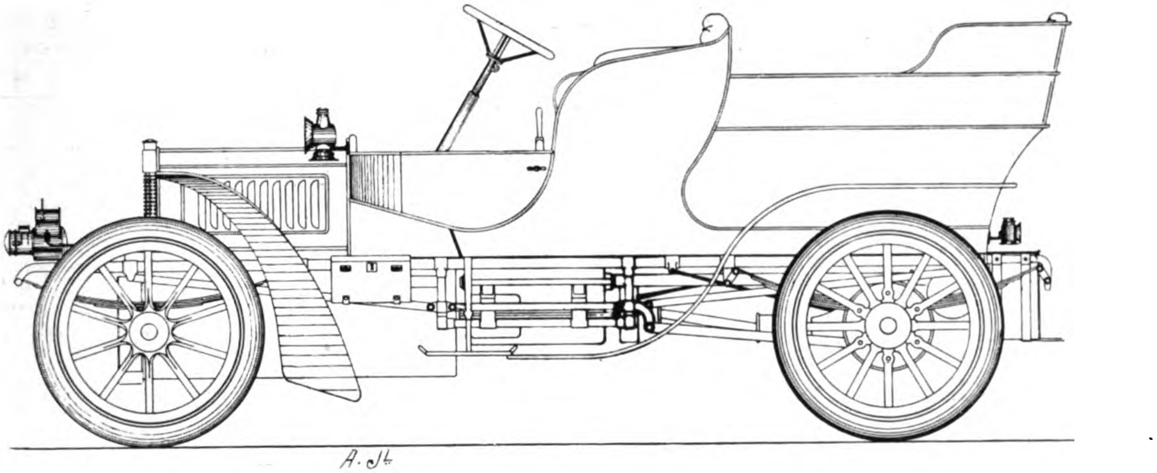


Fig. 1.—12-h.p. Velox Car.

Signs are not wanting which show that English manufacturers realise the importance of the automobile industry, and intend to hold their own against foreign competition in the home market. In spite of the reluctance of the general public to finance manufacturing concerns, a large number of companies have been organised, and have taken up the work on thoroughly sound lines and on a good commercial basis. Coventry and its neighbourhood appears to retain its position to a great extent as the chief centre of the business, and, owing largely to the fact that engineers who have acquired the necessary special knowledge are now available, promotors and the public will before long have every reason to congratulate themselves upon the enterprising spirit being now displayed. Although it is at present too much to expect the automobile industry in England to be on quite so healthy a basis as on the Continent, in view of previous financial troubles, yet we are agreeably surprised at the great progress which is being made in various parts of the country. Many who visited the recent exhibition in Paris must have felt that England was still far from taking the lead in the business, for although the practical outcome of the many novel features introduced on French cars may be doubtful, yet the energy and progressiveness displayed there could not fail to make a deep impression upon motorists. Now, however, that English manufacturers are nearing the completion of their 1903 models, we are able to form some opinion of the position, and we believe that a visit to the forthcoming exhibitions in London will do much to remove any feelings of despondency produced by the Paris show. It is evident, from information now in our hands, that a very large number of English manufacturers have not only been straining every nerve during the past year to produce equally up-to-date models, but that the success attending their efforts will be found to be considerable. It is but natural to suppose that, sooner or later, English-built cars will be found to be more acceptable to English purchasers, and we are glad to be able to think that the last few months have seen considerable strides in this direction.

Amongst the English cars of latest designs, those manufactured by the Velox Motor Manufacturing Company, Limited, of Coventry, are well worth the attention of our readers. They are not only constructed on well established principles, but also possess a few novel features which apparently possess some little merit. Several of these cars are now being built, and we have been allowed to make a very careful examination of them in detail. They will make their first public appearance this month at the forthcoming Stanley Exhibition at Earl's Court. The Velox car is to a certain extent reminiscent of the four-cylinder Humber model of last year, which is not surprising in view of the fact that the same designer was, to a great extent, responsible for the work in both cases. The similarity, however, only strikes one at the first glance, for the details of construction throughout are by no means the same, and a large number of distinctive features have been introduced. The Company have very wisely decided to adhere to a single model for the coming season, and have laid themselves out to build these machines in accordance with the best practice.

The car is fitted with a 4-cylinder motor nominally developing 12-h.p. but actually giving as much as 16-h.p. on the brake. Its nominal speed is 900 revolutions a minute, and its cylinders have a bore of a little over 3½ inches with a stroke of 4 inches. The method of transmission employed follows the general lines in which the power is taken from the gear box by a longitudinal propeller shaft through bevel gearing to a live rear axle. It will be seen, however, that various portions of the mechanism employed display considerable ingenuity and neatness, and that the much-advertised direct-through-drive on the top gear has been embodied in the design. The chief feature of interest in the transmission mechanism, however, is the employment of a spring coupling between the change-speed gear and the propeller shaft in such a manner that the shock imposed on the gearing when starting the car from rest is largely absorbed by springs, and its effect is, therefore, cushioned. The construction of the frame, and the method of attaching the various parts to it, are also interesting, whilst the means of suspending the main frame above the rear axle is somewhat novel.

With the assistance of the illustrations, which we reproduce, we shall now proceed to a detailed description of the car, following the principle generally adopted by us of dealing with the framework, the engine, the change-speed gear, and the other important parts, separately, and of using similar letters for similar parts throughout the article.

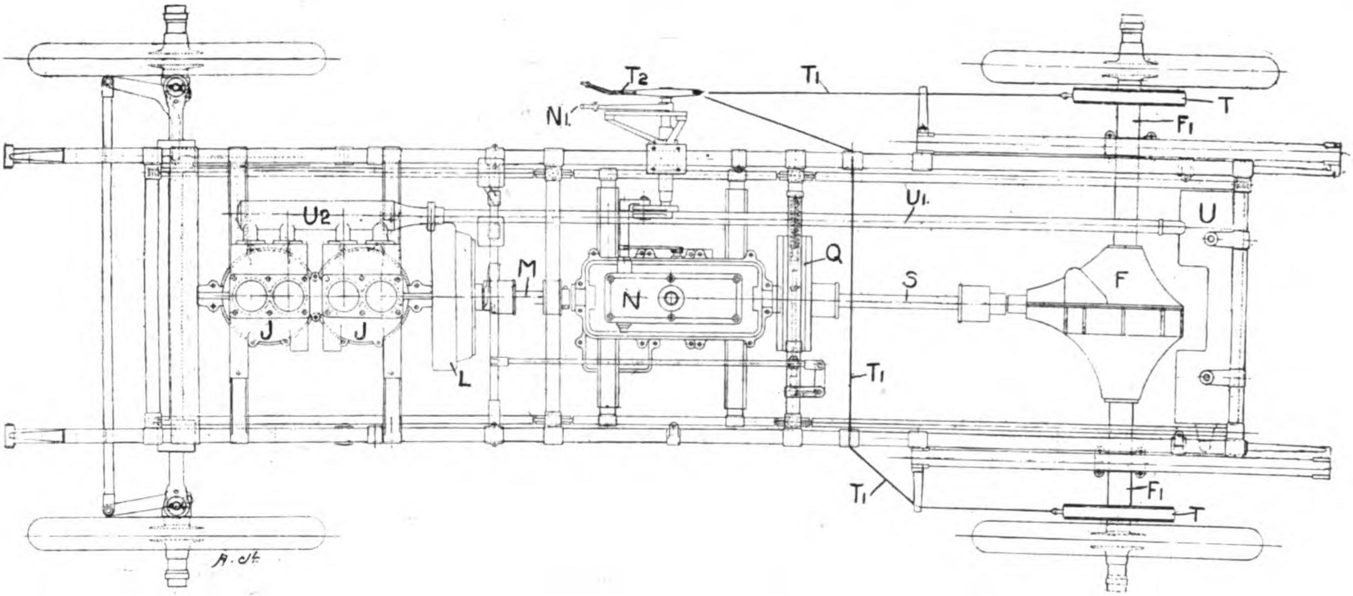


FIG. 2.—Plan of Velox Chassis.

The general appearance of the complete vehicle is seen in Fig. 1. The wheel base is 8 feet 6 inches, the track 4 feet 3 inches, the height of the main frame from the ground is 2 feet, and the lowest part of the mechanism has a clearance of 9 inches from the road. The over-all dimensions of the car without hood are 12 feet long by 4 feet 9 inches wide by 4 feet 6 inches high. The total weight is about 16 cwt. The body provides ample room for the passengers, both on the front seat and in the tonneau. The bonnet encloses the engine above and on each side, and a radiator through which the air is drawn by a fan forms the front of it. Special attention has been given to rendering the mechanism beneath the body as accessible as possible, and for this purpose it is divided at about 12 inches behind the dashboard. The main portion of the body is hinged to the rear of the frame, and it can be swung up, out of the way, when desired. A handy box for carrying tools or other articles is fixed to the rear of the frame, and the top of it is covered with a rubber mat to allow it to be used as a second step, the first step projecting from the bottom of the box. Sufficient space for carrying a spare tyre is provided beneath the floor of the tonneau, and is accessible from the back. The artillery wheels are all 32 inches in diameter, and are shod with 3½-inch Dunlop tyres.

The chassis is shown in plan in Fig. 2, and a photograph giving a similar view of it is seen in Fig. 3. The main frame, which is tubular, is illustrated separately in plan, side elevation, and cross sections, in Fig. 4. The front and rear portions of it are also represented by photographs in Figs. 5 and 6. The upper portion of the frame is rectangular with four cross members in the same plane as the two side members, A. It is stiffened at each side by stays, which brace its two ends to downwardly-projecting tubes, A^1. The

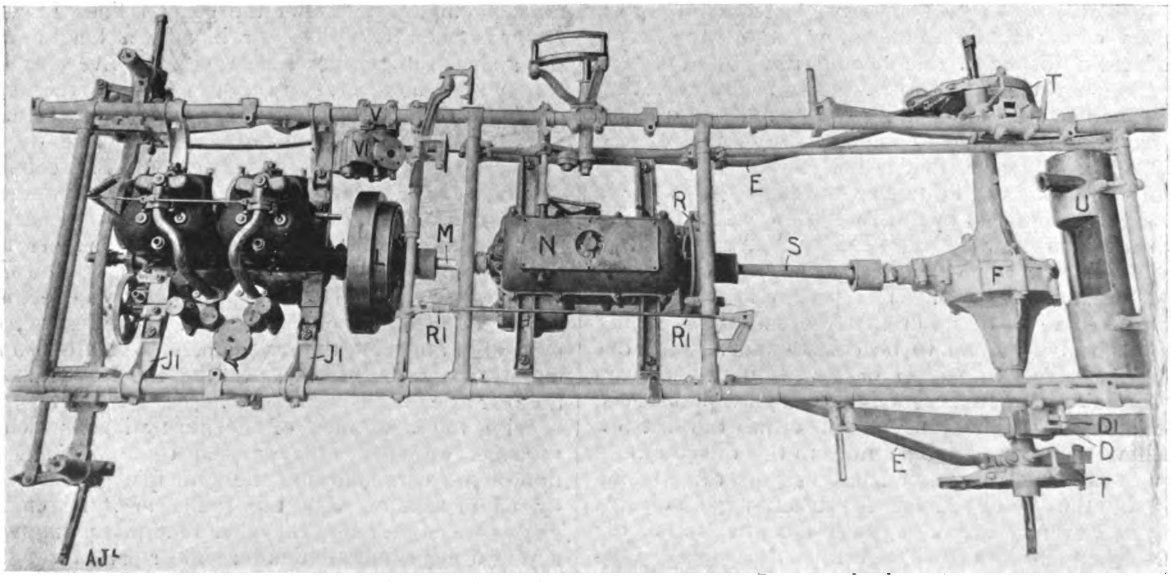


FIG. 3. – View of Velox Chassis from above.

THE NEW YORK PUBLIC LIBRARY ASTOR, LENOX AND TILDEN FOUNDATIONS

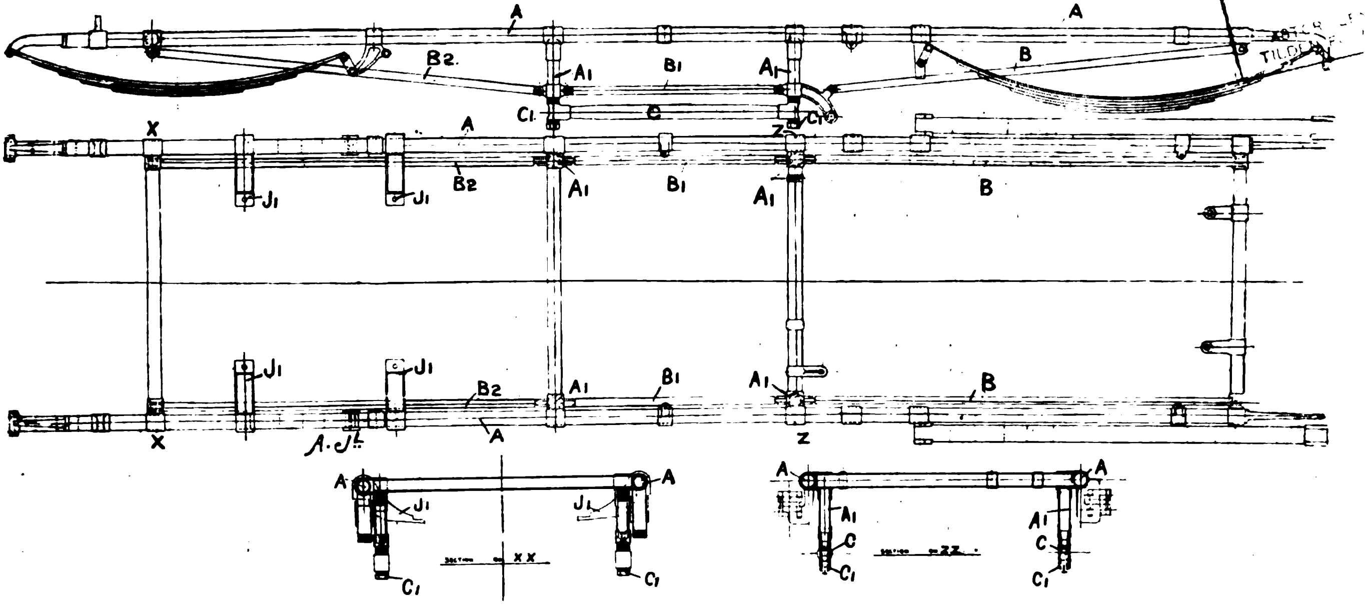


FIG. 4.—Side Elevation, Plan and Cross Sections of Frame.

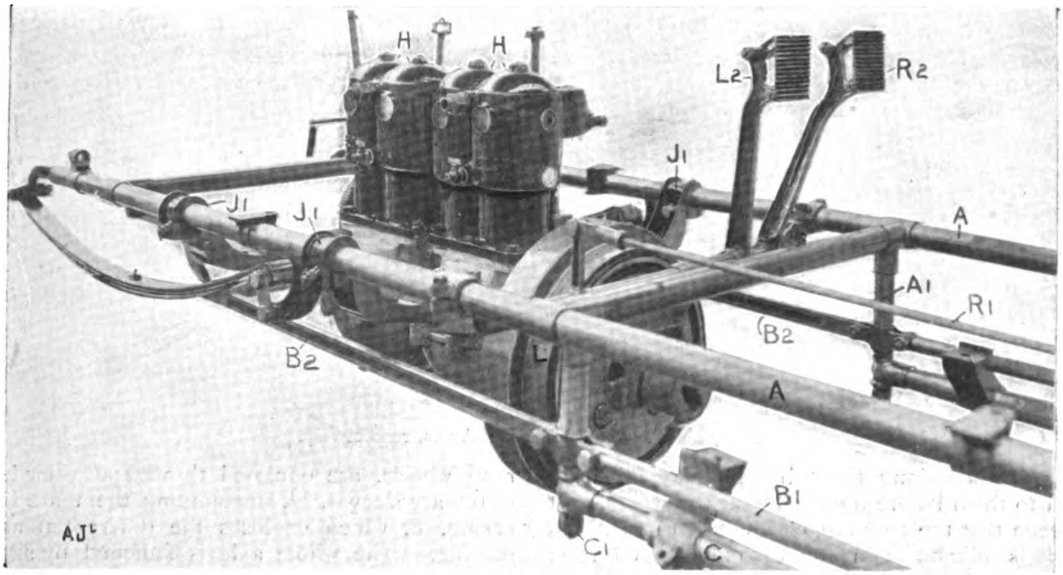


FIG. 5.—Front Portion of Velox Chassis.

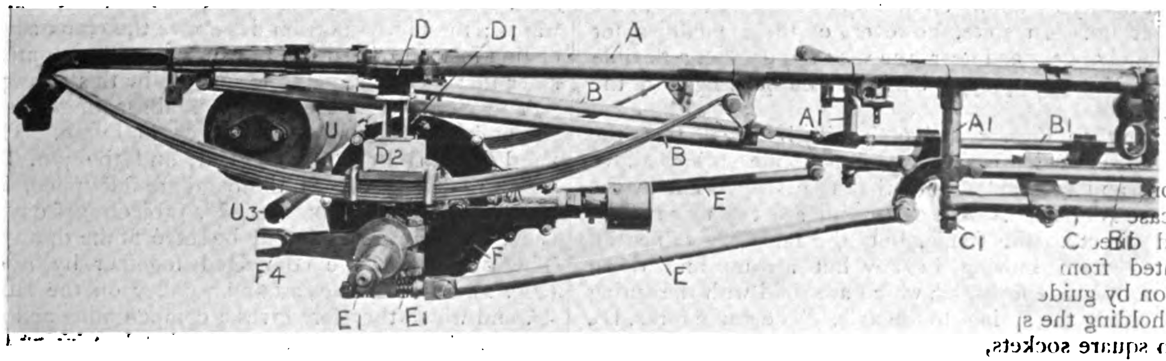
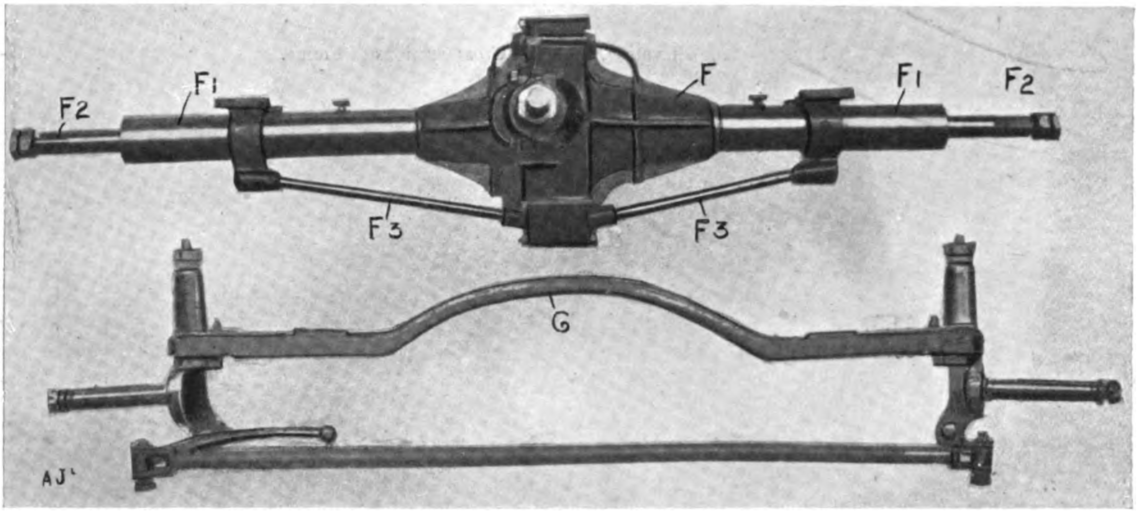


FIG. 6.—Rear Portion of Chassis.

brackets and horns for carrying the springs are brazed solid with it, but those to which the various parts of the mechanism are fixed are secured to the tubes by clips. The stays, B, pass from the rear member of the frame to the brackets by which the distance rods, E, are pivoted to the vertical tubes, A^1; the stays, B^1, connect the tubes, A^1, on each side together, and the stays, B^2, pass from the forward end of those marked, B^1, up to the front member of the frame. These stays, in combination with the four vertical tubes, A^1, give considerable stiffness to the frame longitudinally. The engine is carried by four brackets, J^1, which are fixed rigidly to the longitudinal tubes after the engine has been lined up in place upon them. The crank chamber, J, has four projecting feet which rest upon and are bolted to these brackets. The gear box, N, is fixed in a somewhat similar way, but is supported by two tubes, C, which have sockets at each end fitting over the lower ends of pins brazed into the tubes, A^1. The pins project downwardly, and the tubes, C, can be lined up with the frame by fitting washers above and below the sockets before tightening up the nuts, C^1, which hold them in place. The projecting feet of the gear box are bolted to brackets, which are free when erecting to slide along the tubes, C, but which are securely fixed to them before the car leaves the works. It will thus be seen that the gear box can be lined up without difficulty, as it is adjustable in any direction. A further advantage which is pointed out in connection with this method of fixing the gear box is that it can at any time be removed bodily by taking off the four nuts, C^1, they alone holding it up. In spite, however, of these facilities for fixing the change-speed gear true with the engine, a flexible coupling, M, is employed between the gearing and the clutch, L.



FIGS. 7 and 8.—Rear and Front Axles, respectively.

Referring to Figs. 5 and 6, it will be seen that the main frame is carried upon long semi-elliptic springs above the front and rear axles, but that the suspension in the latter case is unusual. At neither end are the rear springs pivoted direct to the frame, but the rear axle is instead prevented from moving in any but an up and down direction by guide forks, D^1, which are solid with the spring plates holding the springs to the axle. The guide forks, D^1, slide in square sockets, D, which are rigid with the frame, a kind of horn plate being thus provided. Blocks of rubber, D^2, are fitted above the spring plate in order to cushion the blow in the event of the wheel being caused to rise above a certain distance on any exceptionally bad roads. Distance rods, E, also connect each end of the axle with the frame, but these are not pivoted direct to the axle. The method employed for attaching them is clearly seen in Fig. 6. The springs, E^1, normally hold the rods, E, in their proper positions relatively to the axle, but allow the pin about which they are fitted to slide lengthwise if necessary. It will, of course, be realised that the longitudinal shaft, S, which transmits the power from the spring-drive device, Q, outside the gear box, to the bevel gearing on the live axle allows for any relative motion between the axle and the frame. It remains to be seen how this arrangement will compare in the long run with the more ordinary systems of suspension, but we understand that it has so far shown itself very satisfactory. The front springs are 36 inches long, and the rear springs are 42 inches long. The distance rods, E, are not straight, but curve outwardly towards the axle, as shown in Fig. 3.

The rear axle is represented in Fig. 7, and is of strong construction. The revolving shafts, F^2, which carry the road wheels, are enclosed throughout their length. The stationary sleeves, F^1, surrounding them are rigid with the casing, F, which encloses the differential and the bevel gearing. The whole axle is stiffened by stays, F^3, which pass from beneath the spring brackets to the casing F. The front axle, G (Fig. 8), does not call for any special attention, except that it is bowed upwards instead of downwards; the bowed portion lies above the crank shaft of the engine instead of beneath it, as usual. The company consider that greater strength is secured by this arrangement.

The side brakes are of the double-acting type; one of the brake bands is shown separately in Fig. 9. The metal band itself is lined with poplar, and the pin, T^3, about which the two halves of the band are fulcrumed, is adjustable in a slot in the bracket, F^4, projecting from the axle tube, F^1. The band can thus be set to fit the drum properly. The two brakes are connected together by a cord, T^1 (Fig. 2), which passes around a pulley on the hand lever, T^2, and which therefore gives a compensating action on the brakes. The weight of the bands is taken by small helical springs connecting the eyes, T^4, with small supports passing

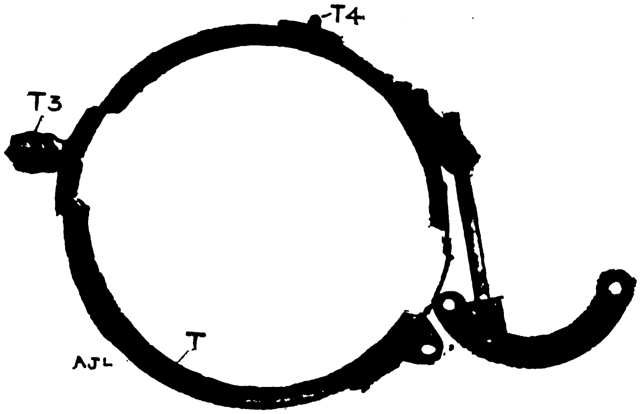


FIG. 9.—Brake Band for Driving Wheels.

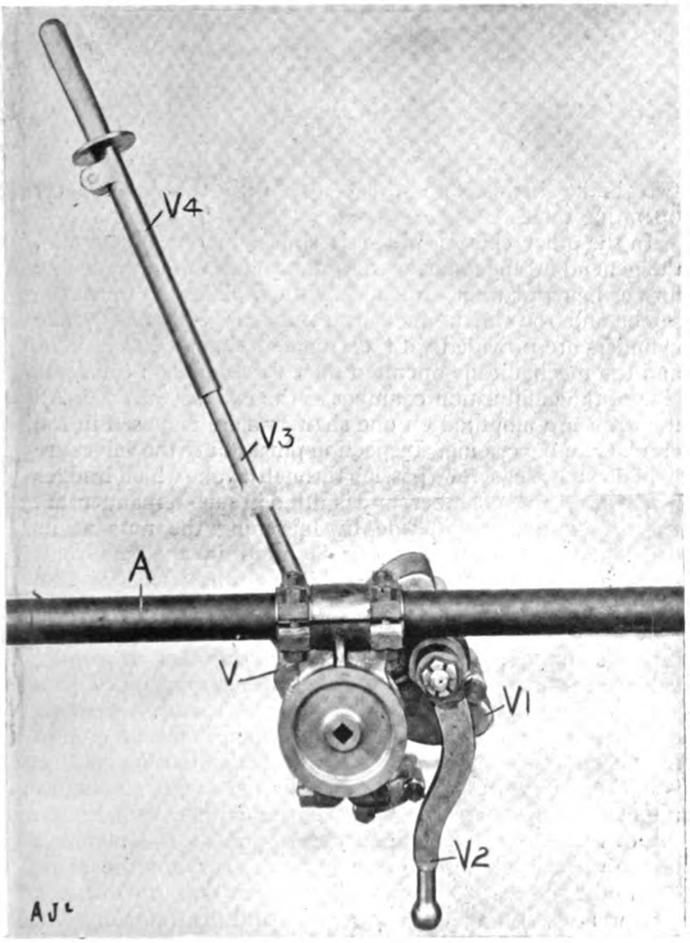


FIG. 10.—The Velox Steering Gear.

up from the axle tubes, F^1. These springs normally hold the brake band clear of the drum. The steering gear is shown in Figs. 10 and 11, and is chiefly interesting because the angle of the pillar can be adjusted to suit the purchaser, and because the attachment of the hand wheel, V^5, to the central rod, V^3, is telescopic, and enables the wheel to be fixed at the required height. For adjustment as to angle, the casing, V^1, which encloses the usual worm and segment, is so shaped that a circular portion of it fits into a bracket, V, which is clipped to the main frame, D. The bracket, V, can be moved a certain distance forward or backward along the tube, and the bracket, V, can be made to hold the casing, V^1, at any angle. The rod leading from the lever, V^2, to the steering head is so made that it can be lengthened or shortened so as to correspond with the adjustment of the steering pillar. The steering pillar, V, is fixed to the casing, V^1, by a flanged joint, and encloses the rod, V^3, which carries the worm wheel. An outer tube, V^4, slides over the upper end of V^3, and is prevented from rotating about it by a feather key. The steering wheel, V^5, is shaped as seen in Fig. 10, and is bolted to a flange on the tube, V^4. When the tube, V^4, is adjusted to the required height, it is clipped by a bolt passing through the lug, V^7.

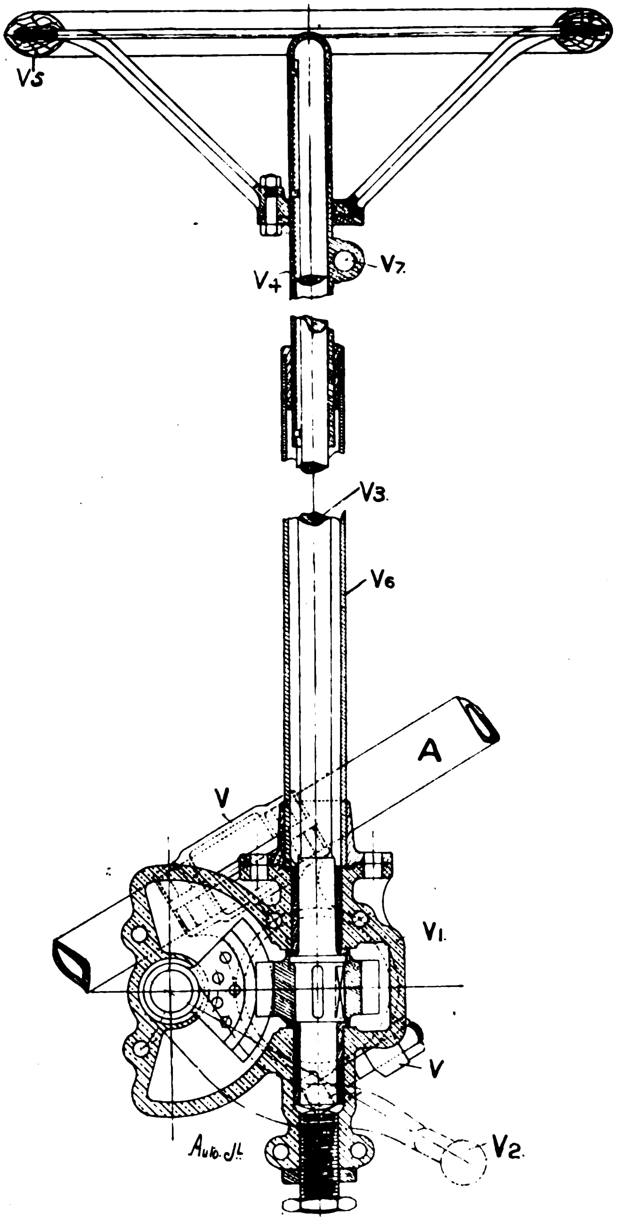
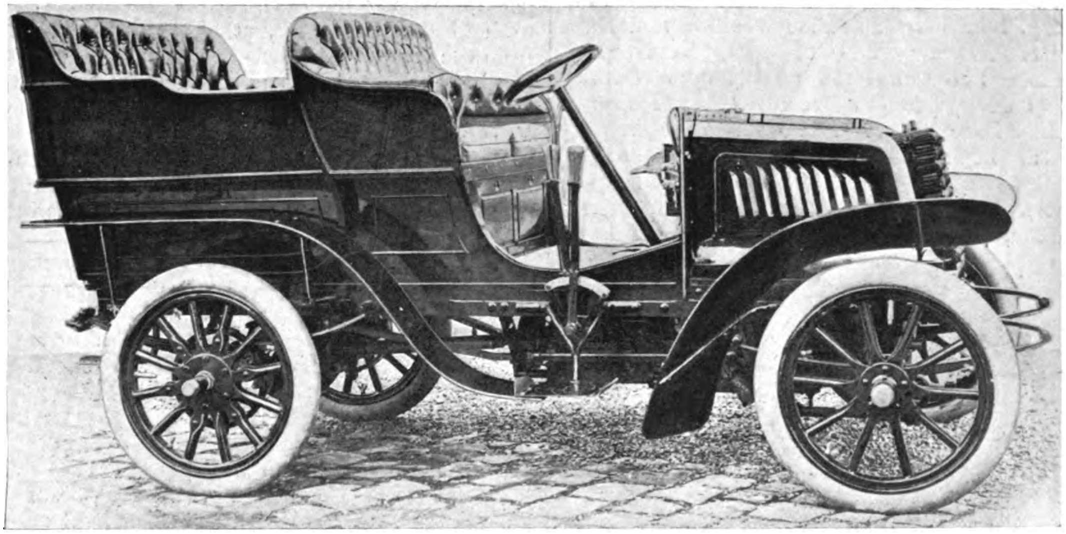


FIG. 11.—Section through Steering Pillar and Gear.

(*To be continued.*)

THE ANNUAL A.C.F. SHOW IN PARIS.—Part IV.



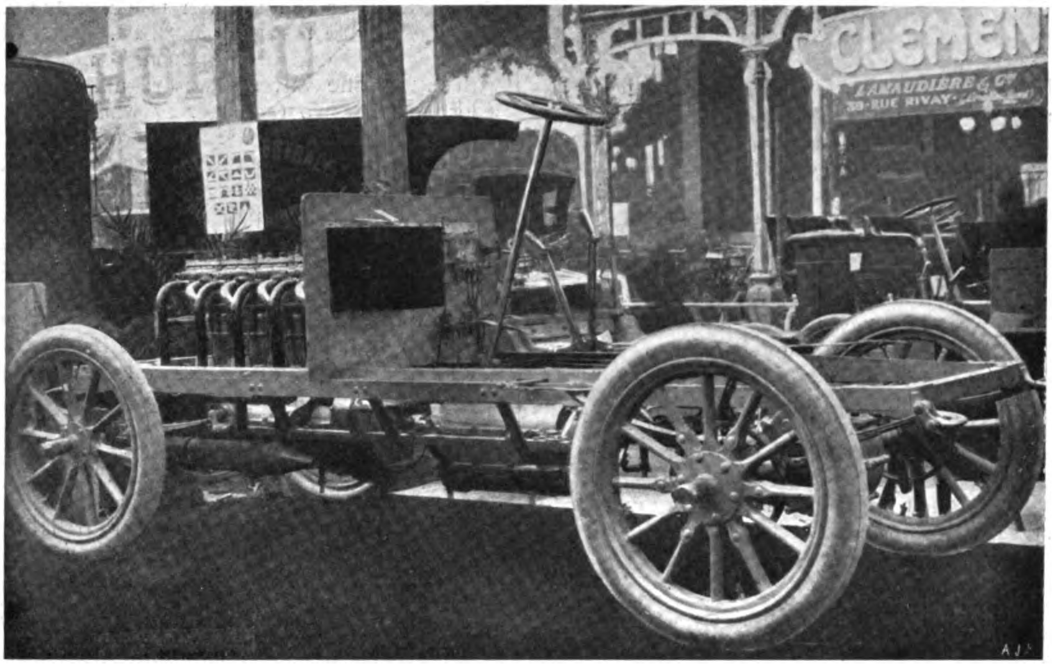
The Tony-Huber Petrol Car.

THE Tony-Huber Company showed one chassis in which the engine had cast-iron cylinders and jackets, and the inlet valves were atmospherically operated. Another chassis was fitted with their steel cylinder motor, which has already been referred to and is again illustrated by us. In both cases the engines are of the 4-cylinder type, carried upon an underframe which also supports the gear-box. The underframe is secured to the mainframe by side brackets and does not bend upwards as usual to meet the front member of the frame. In the earlier model, each pair of cylinders are cast in one piece, and no governor is provided. The rods operating the exhaust valves and actuated by the cams are of very large diameter. Their upper faces form disc cams, and they are so arranged that they can be simultaneously rotated about their axis by a sliding rack. The cam faces are so shaped that when rotated they vary the degree to which the exhaust valve is lifted by the cam and thus regulate the quantity of fresh charge drawn into the cylinders by causing a greater or a less quantity of exhaust gases to be retained in them. The inlet valves are so fixed that they can be removed without disconnecting the induction pipes, and separate exhaust pipes are taken from each cylinder to a first exhaust-box lying alongside the crank chamber. A noticeable feature of the motor is that the water-pipe connections to the jackets are made with a special and rapidly removable form of union, which resembles the toggle-joint stopper employed on some Lager beer bottles; a rubber washer makes the joint, and the pressure is applied by an arrangement of bent wires, one of which forms a toggle lever.

The change-speed gear is connected with the motor through a flexible coupling and a cone clutch of the internal type. The gearing is of the direct-through-drive type in which the lay shaft lies in the same horizontal plane as the direct shaft. The power is taken from the gear-box to a live-rear-axle by a propeller shaft, and the usual band-brake is fixed immediately behind the gear box. The propeller shaft is enclosed in a tube, to which lubricating pipes are led. The side brakes are compensated by a transverse beam, the ends of which are connected with the two brake bands, and the centre with the hand lever operating them.

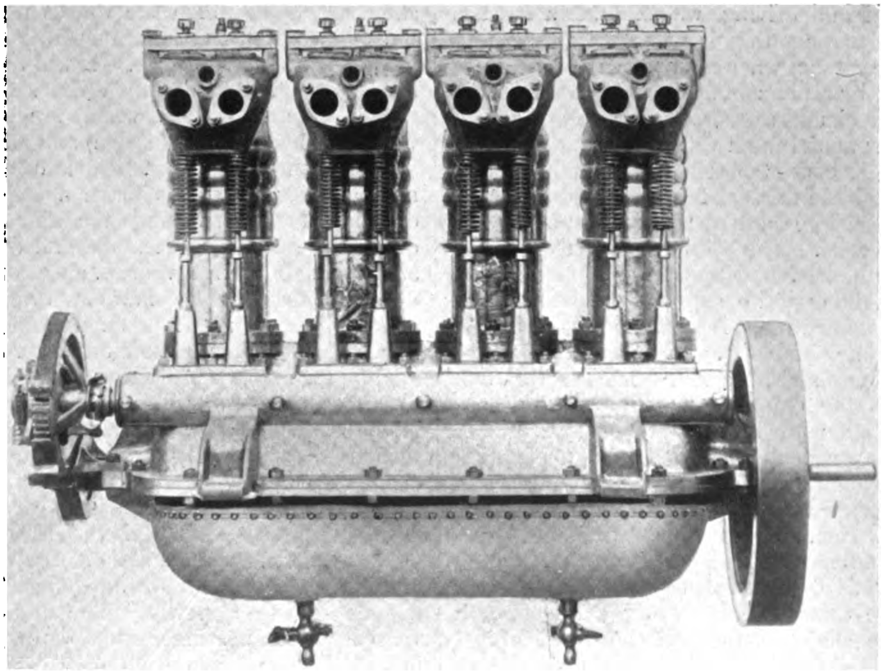
In the other chassis which is shown in our illustration, the general arrangement of the frame and underframe (the former being of wood stiffened by flitch plates), is much the same, and the method of transmission is similar. The cylinders are provided with corrugated sheet-metal jackets, and the mechanically-operated inlet valves are on the same side of the combustion chamber as the exhaust valves. All the cams are mounted on one shaft, and are enclosed in the crank-chamber casting. Inspection plugs above the valves are held down by set-screws passing through a yoke which bridges across the valve chamber, and is fitted in such a manner that it can be swung to one side by loosening the nuts at its ends. A centrifugal governor is fitted in the cam-shaft spur-wheel at its forward end, and this wheel is also in mesh with another spur wheel on the spindle of the circulating pump. These gear wheels are enclosed in a separate casing, and the governor operates a throttle valve on a single carburettor from which four pipes pass separately between the cylinders to the valves. A single warm-air pipe is taken from the neighbourhood of one of the exhaust pipes to the carburettor. High tension ignition is used, and the ignition plugs are arranged vertically above the cylinders. In other respects the Huber vehicles do not call for any more detailed description at the moment, as the various methods of regulating the car are the same as in other cases. We noticed, however, that no distance rods were used between the rear axle and the frame in front. We reproduce a photograph of one of the complete cars.

The Peugeot Company showed two interesting chassis, and were amongst those manufacturers who have adopted a thoroughly progressive policy in their models for this year. The chassis shown represented their 4-cylinder and their 2-cylinder models respectively. The former is constructed with a special steel frame, and an underframe of similar make, which passes from a substantial cross-member behind the flywheel and joins the main frame in front, carrying the engine. The inlet valves, which are operated mechanically, lie on the right-hand side of the combustion chambers,



The Huber Chassis (new model).

and the exhaust valves on the left; separate exhaust pipes of large size lead from each cylinder to an exhaust box alongside the engine. The gear-wheels driving the two cam shafts are enclosed, and the circulating pump is also gear-driven in front of the crank chamber. Both low and high tension igniters are fitted, the former being operated by cams on the same shaft as those which actuate the inlet valves, and the current for them being generated by a gear-driven magneto fixed to the right-hand side of the crank chamber. The same cam-shaft carries a centrifugal governor in front, and operates a chain-driven commutator and a belt-driven lubricator from its rear end. The governor regulates the speed of the engine by a throttle valve. A radiator of the honeycomb pattern is used, the air being drawn through it by a fan placed immediately behind it, and driven by a belt from the engine. The power is transmitted from a cone clutch in the flywheel, through a flexible coupling, to the gear-box, the two shafts in which are arranged in the same horizontal plane as one another. The gear-box is held in place by tubes passing from it to the main frame and enclosing the shafts connecting the differential gear with the outside sprockets. The band brake, operated by a foot pedal, is mounted inside the gear-box, and is of the metal-to-metal form. The gear-box is made in two pieces, the upper portion of which is provided with a removable inspection plate. The centre of gravity is kept low by attaching the rear springs to upwardly projecting brackets fixed to the frame, and by the employment of a low front axle. The rear springs in particular are specially long, and the suspension



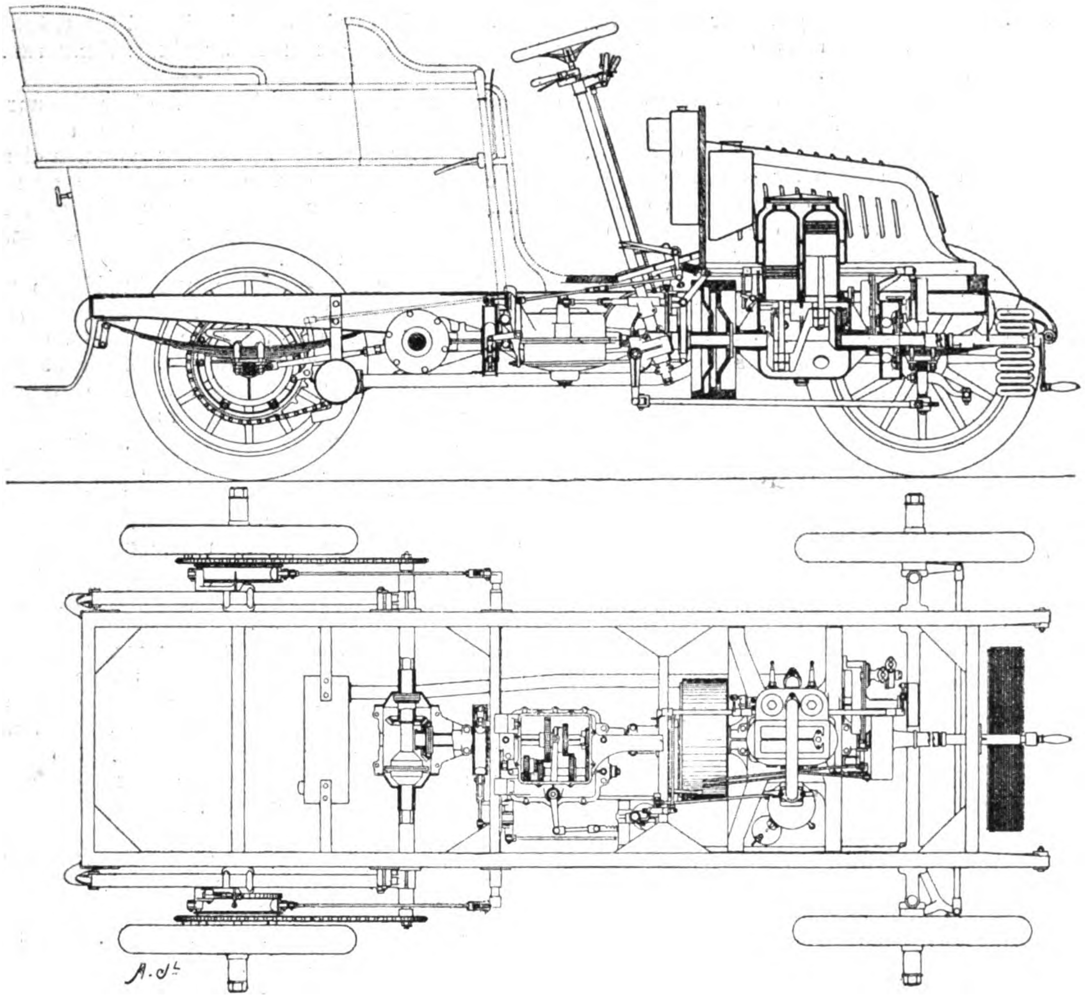
The Huber Engine, with Sheet Metal Water Jackets.

throughout is good. In the 2-cylinder chassis the main frame is constructed of wood, with stiffening flitch-plate; the front axle is bowed about its centre, both downwardly and forward, and the low tension system of ignition alone was employed in the particular machine shown.

The Delahaye Company showed samples of their new 2-cylinder and 4-cylinder chassis, the general construction of which are similar; the former is represented in side elevation and plan in the accompanying illustrations. The main frame is of stamped steel, and there is no underframe. The crank-chamber of the "Titan" engine is provided with feet which rest upon the side members of the frame. The engine is fitted with atmospheric inlet valves, and is automatically controlled by a centrifugal governor mounted on the front end of the cam shaft. The circulating pump is driven by spur gearing, and a separate casing encloses the gear wheels on the front end of the cam shaft. The ignition is of the high tension type, and the timing rod is connected with half-compression cams, which relieve the pressure in the cylinders when starting, and are brought into play as the spark is retarded to its earliest position. A special form of carburettor is employed, and separate exhaust pipes lead from each pair of cylinders to the exhaust box, in front of the back axle. The most noticeable feature of this car is that the change-speed gear is enclosed in a separate casing from the differential gear and the bevel gear driving it; the former is fixed to two cross-members of the frame, and the latter is supported by tubes which enclose the two halves of the countershaft. The band brake, which is operated by a foot pedal, is arranged on the shaft between the gear-box and the differential casing; the gear itself gives a direct-through drive-on the top speed, and the lay-shaft, which is brought into use for the lower speeds, is arranged alongside the through shaft. The power is transmitted from the countershaft to the rear wheels by chains. The usual sprag for preventing the car from running backward on a hill, is replaced by a ratchet wheel fixed inside the brake drum of the right-hand driving wheel, and a pawl is mounted in such a manner that it can be brought into engagement with the ratchet when required. The changes of speed are controlled by a horizontal lever mounted on the steering pillar. Both chassis appeared to be well made.

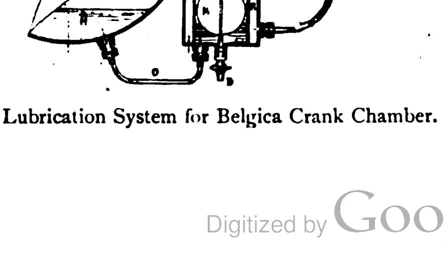
An interesting new model fitted with a 4-cylinder motor was shown by the Rochet - Schneider Company. The main frame is of wood and flitch-plate construction, and the engine and change-speed gear are carried on an underframe constructed of angle steel. The cylinders are cast in pairs, and are provided with mechanically operated inlet valves, which are placed on the opposite sides of the combustion chambers to the exhaust valves. A separate cam-shaft lies each side of the crank chamber for operating the valves; they are driven by brass and fibre spur wheels gearing into a common pinion on the crank-shaft. The built-up spur wheels are constructed with brass discs outside a fibre centre. A low-tension ignition system is adopted, the ignition plugs forming the means for inspecting the inlet valves, and being therefore arranged immediately above them. The time of ignition is variable, and is regulated from the dashboard by a sliding rod having diagonal slots in it which engage with the heads of vertical rods which transmit the motion from the cams to the igniters; the ignition cams are on the same shafts as the inlet cams. Electrical contact is made with each of the ignition plugs by means of knife switches which are pivoted upon a spindle, carried on, but insulated from, brackets formed on the top water pipe. The current for the ignition is generated by a magneto gear-driven from the inlet-cam-shaft. A centrifugal governor on the forward end of the exhaust-cam-shaft is connected with the throttle valve, and is regulated by an accelerator-lever placed above the steering wheel. A Dubrulle lubricator is mounted on the centre of the dashboard and is driven by a belt from a pulley fixed to the rear end of the exhaust-cam-shaft. A combined tank and radiator of the honeycomb pattern is fixed in front of the engine, and is provided with a belt-driven fan immediately behind it. The change-speed gear is of that type in which the first-motion shaft is beneath the second-motion shaft, and the method of transmitting the power to the rear wheels is by side chains from a differential countershaft. There are two band brakes on the countershaft, one on each side of the gear-box; both of them are simultaneously operated by the foot pedal. The main clutch is of the cone type, but it differs from the majority of those now in use in that the spring, which normally causes it to engage, is stationary. The side lever which operates the change gear is mounted on a shaft which passes right across the frame. The gear is of the Mercedes type, in which the lever is moved either forward or backward in one or two parallel slots, and either speed can be brought into use without it being necessary to pass through any intermediate speed positions. A ratchet wheel with pawl is substituted for the sprag. The ends of the countershaft are supported in self-centering brackets, and are fitted with ball bearings. The side brakes are compensated by the employment of small helical springs introduced between the usual fixed portion of the bands and the frame. The side chains are of the twin roller pattern. The main frame of this vehicle is on a somewhat higher level than the majority of new cars, and we noticed that the steering heads were of somewhat unusual construction, the forked bearing, instead of being rigid with and fixed to the axle, form a part of the stub axle upon which the wheels revolve, and the centre pin about which the forked bearings turn is solid with the stationary part of the axle. It will be understood that the head is constructed in much the same way as usual, but that those portions of it which are usually stationary turn with the wheels, in this design, and *vice versâ*.

One of the new 12-h.p. Belgica chassis was shown by the manufacturers, who also make a single-cylinder and a 4-cylinder machine, having the same characteristics and cylinders of the same size. Several very interesting features are possessed by this vehicle, and, although our examination was necessarily somewhat brief, we formed a very good opinion of it. The main frame is built up of ash, stiffened with flitch-plates, and there is no underframe. The motor has two projecting feet on one side and one on the other, so that a three-point suspension is obtained. The main clutch is connected with the change-speed gear through a universally-jointed longitudinal shaft, and the peculiarity of the gear-box is that the countershaft lies across the front end of it, instead of being at the back as is usually the case. The box itself is supported upon the countershaft in front, and is pivoted centrally to a tubular cross member of the frame at the back. It also is, therefore, supported at three points. The ends of the countershaft are carried in bearings fitted with ring lubricators, and mounted spherically on the frame, so as to be self aligning. Side chains transmit the power from the countershaft to the rear wheels as usual.



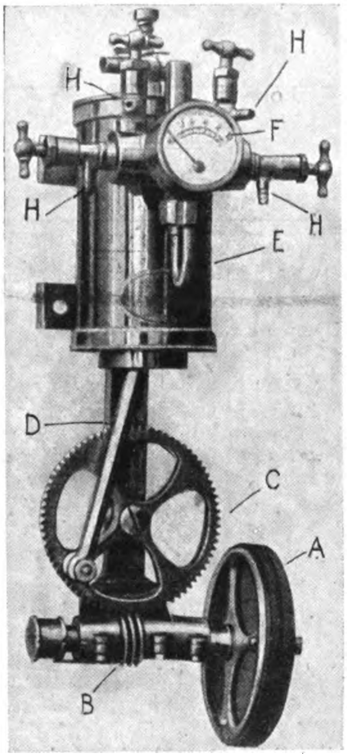
Side Elevation and Plan of 2-cylinder Delahaye Car.

The cylinders are constructed with valve chambers on each side, the mechanically operated inlet valves being on the right, and the exhaust valves on the left. All the valves are of the same size, and are interchangeable. They are unusually large, being 40 mm. in diameter. The dimensions of the cylinder are 120 mm. by 140 mm. The valves are made of nickel steel. The cylinders are so made that they are symmetrical on both sides of the centre line, so that it is immaterial which way round they are placed on the crank chamber when erecting the engine. On the vehicle shown, high tension ignition is employed, the plugs being fitted into the sides of the inlet valve chambers. Provision is also made for inserting catalytic igniters above the exhaust valves, and on some of the engines we understand that magneto ignition is fitted. The crank chamber encloses the two cam shafts, and the body of the carburettor is cast in one piece with the upper portion of it. The gear-wheels driving the cam shafts are enclosed, and a special system of lubrication has been adopted. The various parts are fed with oil on the splash system, but the level of the oil in the crank chamber is kept constant by a float feed device, which is shown in our illustration; it acts in the same manner as in an ordinary carburettor. Referring to the illustration, the oil is led down through the pipe, L, which is wound round the exhaust pipe, E, in order to make the oil more fluid. It is then taken to the chamber, A, into which it is admitted when the float, K, falls below its normal height. From the chamber it finds its way through the pipe, D, into the crank chamber, C, the pipe, P, maintaining the pressure in the upper part of the chamber, A, equal to that in the crank chamber, C. It will also be noticed that the branch pipe, M, leads from the exhaust pipe, E, to the jacket, R, surrounding



Lubrication System for Belgica Crank Chamber.

the chamber, A. A centrifugal governor is mounted upon a vertical spindle, which is driven by bevel gearing off the exhaust-cam-shaft. It runs at twice the speed of the crank-shaft, and operates a throttle valve on the carburettor. The throttle valve is so constructed that when it closes the passage from the mixing chamber, it opens a port through which fresh air is drawn into the cylinders. This device for assisting in cooling the cylinders is already known to our readers in connection with the M.M.C. cars built in Coventry. The water pipes employed are flexible, and the circulating pump is driven by the exhaust-cam-shaft. A gauge connected with it is placed on the dashboard to show whether proper circulation is being maintained or not. The usual brakes are fitted, but that on the countershaft is of a type in which internal and external rollers are caused to grip the inner and outer faces of a brake drum. The rear brakes are of the internal expanding type.



Automatic Pump for Tyre Inflation.

Another interesting device was fitted to the dash of this vehicle, it being an automatic pump for inflating the tyres when necessary. It is shown in one of our illustrations, where it will be seen that the piston of the pump cylinder, E, is driven through the connecting rod, D, from the worm wheel, C. The power from the engine is applied to it through a friction wheel, A, which can be brought into contact with the rim of the flywheel, causing the worm, B, to rotate. On the pump illustrated, it will be seen that four nozzles, H, are provided, so that all four tyres can be pumped up simultaneously, if required. The gauge, F, indicates the degree of pressure obtained.

(*To be continued.*)

A RACING MAN'S VIEW OF THE PARIS EXHIBITION.

(Communicated by CHAS. SANGSTER.)

It is generally granted that grave obstacles surround British motor manufacturers if they are to regain lost ground and overtake, let alone outstrip, their continental rivals. It is not my purpose to write here of these obstacles, but so grave and growing a *danger* has made its appearance lately, that I feel no great apology is required for drawing straightforward attention to it.

May two comparisons be permitted? In yacht racing is it found that the racing man is competent (or the only one competent) to deal with such matters as shape of keel or lines of hull? How many racing skippers are able to say beforehand that such and such a change in matters of this kind will produce such and such results? Will our yachtsmen, who are also motor car owners, tell us? Now for the other comparison, which has more affinity to my point. Bicycle racing to motor car racing may be a far cry, but they are both within the ken of road locomotion, and this will have more point when one calls to mind that the majority, and included in that majority, most of the leading exponents of motor car racing men received their early training as bicycle racers.

The question led up to is, how many bicycle racers are or have been able to advise makers beforehand as to what (or what not) will be an advance in construction? A long and varied experience in this case enables me to answer with confidence the question myself. No advice or help, with a few rare exceptions, have ever been given, and it is notorious that racing cyclists, as a whole, know so little of their machines as to make the subject one of ridicule. That *the bicycle was evolved for the racing man by the maker, and not vice-versa*, is as sure as most things.

In an article which recently appeared in your pages (or in a contemporary) Mr. Chas. Jarrott, on his return from the Paris motor show, writes as a racing man of "The lessons to be learnt, &c.," but on careful perusal, it is not evident what those lessons are unless it be that manufacturers and agents, or, rather, agents and manufacturers are admonished to "pull together." The rest of the article consists mainly of cheap sneers at certain phases of construction which are identified with the Mercedes design, and an expression of self satisfaction of British manufacturers as they appear to-day against Continental, and in these expressions, coming from such an eminent authority, and backed up as they have been by many of the British technical journals, lies the danger of which I crave your readers' permission to comment on as a mere manufacturer, whose whole and sole interest is in the sale of English cars, and whose interests do not mainly consist in the exploitation of Continental manufacturers, and the earning of an occasional commission on the sale of an English car here and there.

It is my purpose within the narrow scope of this article to endeavour to show that some of our British papers are unwittingly injuring the British manufacturers by allowing them to believe that we are occupying a position in motor manufacture which we do not occupy, and that in some cases are possibly being deliberately misled by people who should know better, or who are not the experts they would have us believe. The British visitors to the Paris Exhibition were many, and a very great proportion of them consisted of gentlemen neither motor agents nor motor manufacturers, but who as a class are most competent to judge of the issue which I have ventured to raise—men at the head of important and varied British industries, men who are just as keen on Britain holding her proper place in the motor industry of the world as any one at home directly interested in the motor trade, and to such I make my appeal, and without further ado ask what does it mean when Mr. Jarrott writes for the benefit of those people who are compelled to stay at home, that "All the French makers are being lured on in the direction of complications . . . because of the Mercedes?" Can it mean that his advice to British makers is, "Be careful that you do not do likewise?" One would have no justification whatever in assuming for one instant that the advice was not other than entirely disinterested, but one may claim the right to enquire whether, at least, the advice is sound. Let us do so. The outstanding features of the Mercedes, copied by the leading French makers—and none are so high or mighty as not to have copied—are, roughly speaking, three in number:—(1) The Chassis Embouti (pressed steel under-carriage of channel section); (2) Mechanically operated inlet valves; (3) Multi-tubular radiator of special design and construction.

As to (1), the new steel frames, notwithstanding Mr. Jarrott's opinion, are a very great advance indeed on the old L section iron and wood frames. They are lighter, stronger, and, when sufficient quantities have been produced out of the tools for making them to cover the cost of those tools, will be greatly cheaper than the old style.

(2) Mechanically operated inlet valves are discounted; it is not clear why, unless it is argued that they are more complicated. Are they? Making a comparison between them, and the valves worked by suction there is still only one valve, one spring, one washer, and one cotter. The only possible disadvantage (?) is the adding of a cam to a shaft which is already in existence, so that by mechanical operation it is possible to get a positive time of opening and a positive time of closing irrespective and independently of any of the conditions which may cause the induction valve by suction to vary its work from time to time and when over and above this advantage the means to run an engine extremely slowly without bringing it to a standstill, is added is it difficult to find a reason for changing?

(3) The Mercedes type of radiator or something similar, and which is not at present generally fitted in this country, is more efficient than the radiators which we are still requested to adhere to by our friends. The proof as to whether this advice is sound is a short one. No radiator ordinarily fitted in this country will keep the water cool enough so that a car does not require refilling for, say, 500 miles, whereas it is claimed that the other type of Continental radiator will do very much better than this; but any way it will be readily granted by everyone that the last mentioned is at least as efficient as the other, and there is no argument about the one fact that it does not require a great water tank somewhere at the back of the car with all its attendant complication of pipes to and fro; moreover, such a tank and its contents are very heavy, while the Mercedes radiator requires no separate tank, being in itself tank and radiator combined.

The one other point, as I understand it, in the lessons which we are to learn is that *in simplicity we can be taught nothing*, and comparison is made between a certain car and French makes. I must deny myself the doubtful privilege of criticising that comparison. Mr. Jarrott must have been very deaf if he did not hear some of the many remarks passed both in the Exhibition and at hotels by our own countrymen, and I leave it for those visitors to say whether the comparison had better have been made or not. On the score of simplicity we have many leaves to take from our Continental competitors' books; the care and thought which has been taken to get from here to there in the shortest and straightest manner is nothing short of amazing, and it is sheer folly to blind our eyes to the facts.

I am conscious that in approaching this matter I am performing a thankless, self-imposed task, and I expect to be greeted from certain quarters with howls of derision, but all the same I am encouraged to go on in the belief that the purchase of British motor cars depends so much on broad-minded intelligence and so little on narrow-minded prejudice that there is more prospect of the British aristocracy and the British upper classes being weaned from cars of foreign manufacture, if they become conscious that there is at least a section of British makers who are alive to our shortcomings, and who are willing to learn from those who can teach, and to copy if need be from those who at present lead, instead of feeling all the time that by supporting home industries they are being called upon to put up with the defects which may, and at the present time do, exist through drawing our cloak of insular exclusiveness around us, and falling into the good old British error of holding our enemy too cheaply, and I say, although I can hear already the rush of the storm which I am gathering about my head, that it would be kinder and sounder policy for our British technical journals to realise the situation and convey the facts to the British manufacturer. It is all nonsense to argue from a visit to the recent Paris Exhibition that we are regaining lost ground; it was only too painfully evident that we are doing nothing of the kind, and that we are farther behind than ever.

One personal explanation is necessary before I close. I am sure to be accused of, how shall I put it, or may I write it?—well—"as calling stinking fish," especially as I am interested in the sale and manufacture of an English car, the name of which it is not necessary to mention here. No claim has ever been made for that car that it is perfection, and no claim is now made that that car at present embodies in its construction the technical points which have been touched upon above, but I say that, after deliberation, I am determined to avail myself of some of those improvements which I saw at the Paris show, and viewed as a competitive British manufacturer, improvements which are really advances, notwithstanding what Mr. Jarrott says, and while at first blush it might seem more advantageous for my firm to attempt to steal a march on our fellow British makers, I think for the good of our motor industry it is more honourable and more wise to straightforwardly express my views and convictions than to join in the attempts which are being made to mislead home makers—attempts by persons whose interests are only partially, and, in some cases, very partially, in cars of English manufacture. It seems to me that the future of my company will be better assured by a strong British industry, well rooted in all towns and cities suited for manufacture, than by the individual glorification of one or two isolated firms and individuals. The more strong British makers there are the sooner we shall take the place we covet. Surely, that position will not be obtained by an ostrich-like policy on the part of the makers, or by the "wish father to the thought" style so evident in the writings of our many and able technical journalists, or by both of the groups named being led by the nose by people who have many and varied foreign interests to conserve.

HOSPITALIER'S INDICATOR.

CONSIDERABLE difficulties are involved in obtaining accurate diagrams from high-speed explosion engines by the use of the ordinary indicators hitherto employed. Our article describing the Mathot recorder the week before last dealt with this question in considerable detail, and the following description of the apparatus introduced by M. Hospitalier, which is more specially useful for laboratory purpose, will therefore be of interest. This instrument is not only exceedingly ingenious, but it overcomes many of the mechanical and other difficulties involved in the most satisfactory manner, and enables diagrams to be obtained with greatly improved facility and accuracy.

We give three views of M. Hospitalier's apparatus. Fig. 1 shows the general arrangement, and Fig. 2 is a section of the actual indicating apparatus itself.

The principle on which M. Hospitalier works is that of deflecting a beam of light by a small mirror which is subjected to two sets of impulses. One of these is proportionate to the pressure in the working cylinder, and the other corresponds with the movements of the piston. The angular deflection of the beam of light consequently represents this combined movement, and when employed to produce a photographic image, or when thrown on a screen, produces a diagram, as shown to the left of Fig. 1. Owing to the extreme rapidity with which the beam of light moves, and the persistence of the effect it produces on the eye, this image appears continuous as long as the engine is operating in approximately the same way.

Referring to Fig. 2, K is either a piece of ground glass or a photographic plate or film. M is the mirror which is mounted on two flat springs and is displaceable by the rods, R and R^1. L is the lamp from which the beam of light is reflected by the double reflecting prism, P, on to the mirror, M, and from the mirror on to the plate, K. While the mirror, M, remains motionless the spot of light produced by it on the surface of K remains motionless. Any movement imparted to M will cause the spot of light to describe a certain path or curve. D is a diaphragm connected by the tube, T, with the interior of the working end of the cylinder and the mirror, M, by means of the rod, R, and the movements of the diaphragm are by this means transmitted to the mirror.

It is necessary, however, in order that the movement of the spot of light may correspond with what is taking place inside the cylinder, and so produce a diagram directly indicative of the action of the engine, that the two rods, R and R^1, should execute movements corresponding respectively to the pressure of the gases in the cylinder and the movements of the piston. The movements of R are produced by the diaphragm, D. This is connected with the interior of the cylinder by the tube, T. As the pressure in the cylinder increases, the diaphragm moves outwards, and the rod, R, tilts the mirror in one direction. The rod, R^1, tilts it in a direction at right angles to the former, its movement being caused to correspond with the movements of the piston by a flexible shaft attached at one end to the crank of the engine, and at the other end to the socket, S. This socket communicates movement to the crank and connecting rod, H, which reproduces accurately the movements of the piston. When this rod, H, is in synchronism with the piston, therefore, the mirror performs a composite movement corresponding partly to the movements of the piston, and partly to the resulting pressure in the cylinder, and the reflected beam of light therefore executes the correct diagram on the screen. Synchronism between the connecting rod, H, and the movements of the piston is ensured by means of a screw, F, which permits of the flexible shaft being rotated around S^2. This is done by means of the worm, which engages with the spur wheel, H, on which the two small wheels, S, and S^2, are mounted, and so enables S^1, which is a planet wheel to S^2, and is connected

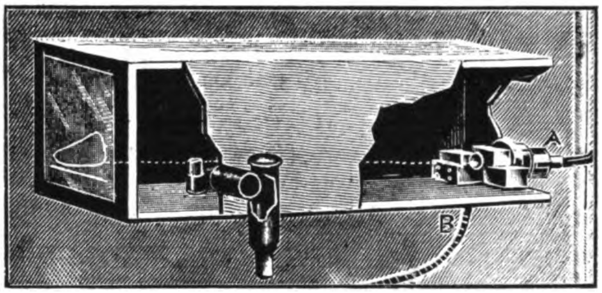


FIG. 1.—The Hospitalier Indicator.

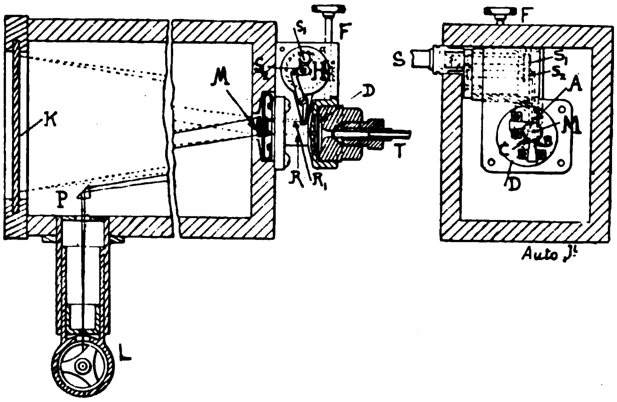


FIG 2.—Hospitalier's Indicator in Section.

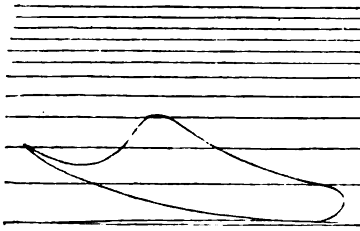


FIG. 3.

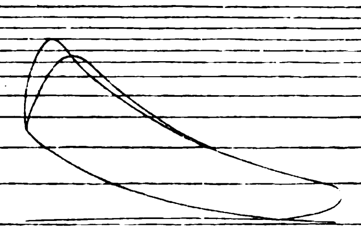


FIG. 4.

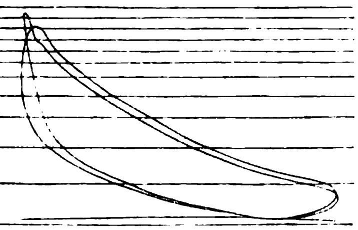


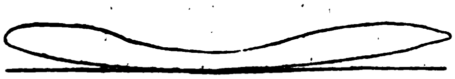
FIG. 5.

Hospitalier's Indicator Diagrams.

with and turned by the socket, S, to be turned more or less round S^2. This is a permanent adjustment and enables the movements of the rod, R^1, to be brought into synchronism with the movements of the piston. The ratio is such that a complete stroke of the piston causes a horizontal movement of the rod, R^1, of 100 mm., while the rod, R, which moves in correspondence with the pressures is displaced 10 mm. for every kilogram per square centimetre.

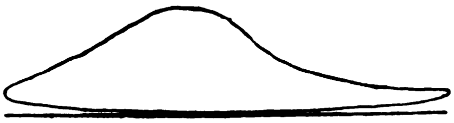
We saw this apparatus in operation on the Algrin motor at the Paris Alcohol Exhibition last May, and were very favourably impressed by its admirable performance as a laboratory instrument. We reproduce the three accompanying diagrams, Figs. 3, 4 and 5, which show what perfect results can be obtained with this apparatus, and how faithfully they recall the occurrences taking place inside the cylinder.

FIG. 6.



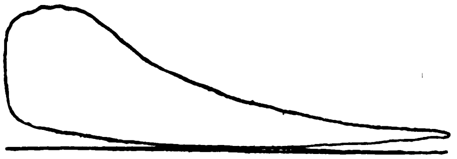
Late fire.

FIG. 7.



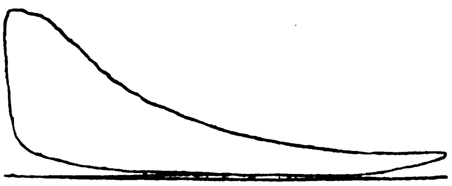
20 mm. lead.

FIG. 8.



45 mm. lead.

FIG. 9.



65 mm. lead.

Herr Schulze's Indicator Diagram.

A precisely similar apparatus, depending upon the same principle and employing the same general arrangements, is described as having been introduced by Herr Otto Schulze, of Strassburg. The apparatus is said to be sufficiently dead beat to be capable of being mounted on a car when actually running. As an example of the accuracy with which this class of apparatus records the occurrences inside the cylinder, we reproduce the four following diagrams, Figs 6 to 9, which were obtained by Schulze's apparatus from a Werner bicycle motor. The first of these shows a missfire produced by ignition taking place on the dead centre. The second is obtained with ignition occurring when the piston was 20 mm. before the dead centre, while the third and fourth were obtained with pre-ignition of 45 mm. and 65 mm. respectively. By the ignition is, of course, meant the moment at which the spark passed, not that at which the combustion of the explosive mixture was complete.

THE SUTTON "HEAVY-OIL" CAR.

OUR frontispiece is reproduced from a photograph which has been sent to us by Mr. Henry Sutton, of Melbourne. The vehicle has been constructed by himself, and is chiefly interesting because it uses ordinary lamp oil as fuel. He informs us that it can be started without any preliminary heating, even when the engine is cold, on ordinary Russoline, which is a petroleum oil having a specific gravity of ·825. It appears that the car has been running for some little time, and has shown itself capable with its two gears and single cylinder engine, of travelling successfully over the roads met with in Victoria. We are assured that no visible exhaust gases are emitted, and that the engine has worked for a considerable period, and has shown no sign of carbon deposits.

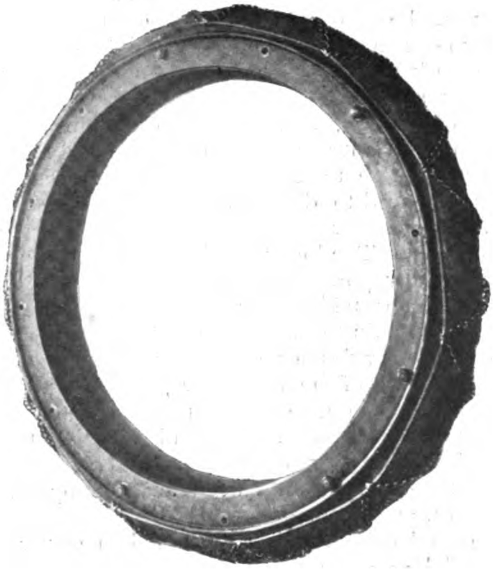
The cylinder has a bore of 4½ in., and a stroke of 6 in., and the power developed is 6·3 brake h.p. at 800 revolutions per minute. The ignition system adopted is the same as that employed on the majority of petrol motors, an ordinary ignition plug, across the points of which a high tension spark jumps, being used. Under ordinary working conditions, the speed of the engine is varied by regulating the time of ignition, and under no circumstances, so we were informed, is it necessary to vary the fuel feed. So far as we can at present gather, the oil is fed through a needle valve and allowed to drop on a number of gauge screens placed in a chamber which, after starting, is heated by the exhaust gases. The lower portion of the chamber is open, so that any unvaporised oil can find its way out, and a pipe is provided for taking any such overflow into a small reservoir. Mr. Sutton's English patent, which was taken out in 1899, provides for governing the engine by varying the degree of lift of the inlet valve, and the mechanism is so designed that in its extreme position, after it has prevented the inlet valve from opening at all, the exhaust valve is lifted. Apparently this method of regulating the speed of the engine has not been adopted by him on the car which we illustrate.

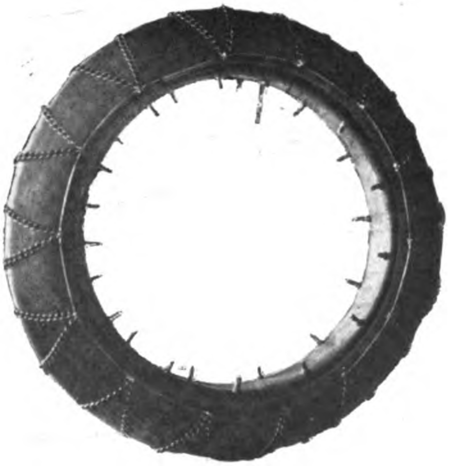
The complete vehicle is represented in our frontispiece, and it will be noticed that many features of its design are unusual. The body is suspended above the front axle by semi-elliptic side springs, the front ends of which are carried by a transverse spring sloping downward and forward centrally. Semi-elliptic springs are also used at the rear, the back ends being connected together by a transverse spring. The motor is fixed in a vertical position beneath the driver's seat, and the power is taken from it through either of two chains to a countershaft, and from the countershaft by a single chain to the differential gear on the live rear axle. The motor is water cooled, and a radiator is placed beneath the body, behind the cross-spring in front. Two speeds only are provided, giving a gear ratio between the motor and the driving wheels of one to five and one to nine respectively. Either speed is brought into play by means of a clutch. The form of the body is clearly shown in the illustration, and it will be noticed that the steering pillar is vertical, that the Ackerman principle has been adopted, that a side lever controls the rear brakes, and that the wheels are of artillery type. Pneumatic tyres are fitted. The car weighs something over a ton, loaded, and its fuel consumption is said to work out at one gallon for 44 miles when using Russoline.

MR. HARRY PARSONS' SIDE-SLIP PREVENTER.

EVERY automobilist recognises the dangers of side-slip. They were well illustrated in the Badminton Book, where an inexperienced driver is shown in one of the amusing pictures in that work side-slipping in Piccadilly, with the result that he comes into such forcible contact with a lamp-post as to bring the latter down on his car, while to add a further element of unpleasantness, he is apprehended by a policeman. If all that is said about the Parsons side-slip preventer is true—and it appears to have been subjected to a very exhaustive series of tests by a number of experienced automobilists—this picture will belong to what M. Baudry de Saunier calls "the heroic age" of automobilism, for there will be no more side-slips. Their memory alone will survive, and in the years to come old gentlemen will wag their heads sagely and date their recollections of the past from the days when there *was* side-slip.

Side-slip and dust have been rightly termed the remaining bugbears of automobilism. The dust nuisance, in spite of some sporadic experiments, is still with us. But since recent improvements in tyre construction and the improved reliability of tyres, as demonstrated by the recent tyre trials, side-slip remains the only other serious trouble that the motor car has to deal with. Any appliance, therefore, that will really satisfactorily and permanently get rid of it would be of the highest importance, and is sure to command an important sale.





The Parsons side-slip preventer consists essentially of two hoops mounted on either side of the rims of the wheels. One of these hoops is endless, and is put on outside the inner rim of the wheel; the other hoop, lying outside the rim, is provided with a coupling so that it can be adjusted to the rim. Lengths of fine mesh chain resembling curb chain are threaded across zigzag-wise over the surface of the tyre, the ends of the chain being attached to the hoops. The whole arrangement must be kept slack, so as to be capable of movement relatively to the tyre.

In practice the chain embeds itself in the road surface at an angle to the direction in which the car is proceeding, and if there is danger of slip, the chain at once stops it. At the same time there is a tendency for the hoops carrying the chains to run round slightly slower than the wheel itself—much the same thing, in fact, as occurs in the case of the rail-ring tractor—consequently the chains do not continue to press on the same part of the tyre. The wear is said to be very slight in consequence. Of course, the whole question practically resolves itself into one of wear and tear. If the chains last fairly well, and the life of the tyres is not seriously interfered with, the invention ought to prove most successful, for when in use there seems to be no doubt that it is an absolute preventative. There may also be a slight tendency to diminish speed, as embedding the chain in the surface of the tyre and also in the road surface must absorb a slight amount of energy. There is no reason to suppose, however, that this will prove an important matter.

The only serious attempt to deal previously with the side-slip difficulty with which we are acquainted is the Williams side-slip preventer, which was described in the Journal of August 9th, (p. 416). This consists of a pair of sharp-edged disc wheels, which are let down into engagement with the road. The driver consequently has to anticipate side-slip and let down his gear to be prepared for it. Its efficiency is also dependent on the degree to which the tyres are pumped up. The Parsons slip preventer has not these disadvantages, as it is there when wanted, and works quite as well with slack tyres as with fully-pumped-up ones; and, of course, in thorough dry weather can be removed altogether.

It is interesting to learn that a number of the Royal cars at Sandringham have already been fitted with the appliance. In fact, one of our illustrations shows a solid tyre from one of the King's carriages fitted with it, while the other is a 36-inch Collier tyre similarly equipped.

* * *

EDISON'S storage battery, it is unofficially stated, will be exhibited in its completed form at the New York Madison Gardens Automobile Show opening next week. Three machines equipped with these batteries are reported to have been for some time in daily operation on the roads of New Jersey in the vicinity of the Edison works, one having covered 100 miles every day, according to the story.

THE KREBS CARBURETTOR.

We referred to the Krebs carburettor, in connection with the Paris Exhibition, in our issue of 20th December. We then explained the general principles on which it is constructed. We give herewith an illustrated description of the new mechanism, a paper on which has recently been read before the Paris Académie des Sciences, by its inventor, Commandant Krebs. Readers of our articles on the Paris Exhibition will call to mind the principles on which the carburettor is constructed. Its object is to maintain a constant degree of carburisation at all speeds of the engine, so that each active stroke develops the same power, and the total power of the motor is consequently directly proportional to its speed. This is done by maintaining the current of air which passes round the nozzle of the carburettor, and does the spraying, practically independent of the general air supply, and is effected by providing a variable additional air supply which may be regarded as forming a shunt or by-pass on the air feed which does the spraying, the amount of this additional air being automatically adjusted to compensate for speed and throttle.

In his paper before the Académie des Sciences, Commandant Krebs introduces a lot of calculations and formulæ to show how he obtains the form of the additional air apertures. It is noticeable that in these calculations he omits to allow for the increasing tangential friction of air at increased velocity, and also assumes that the amount of petrol sprayed from the nozzle is directly proportional to the speed of the air current around it. His calculations, however, give a practically satisfactory result, because the above errors are counteracted by another mistake. When an engine runs at one time at twice the speed at which it does at another, each piston stroke takes place in half the time at the higher speed. Consequently, the rate at which the fuel issues from the nozzle of the sprayer must be twice what it is at the lower speed to supply the same amount of fuel. This consideration seems also to have been omitted from his calculations by Commandant Krebs. The result of the two errors appears to have been to compensate one another, as he appears to have given the right shape to his apertures, since, as we understand, the carburettor works admirably in practice. We think it very likely that the shape given to the apertures was arrived at by repeated experiments, and that the calculations were an afterthought introduced for the benefit of the Academy of Sciences.

Figs. 1 and 2 illustrate the new carburettor. The fuel arrives from the petrol tank at Z, passes through the filter, I, which is particularly accessible, as it can be got at by simply unscrewing the cap, N, and rises into the float-feed chamber, B, which maintains a constant level in the spray pipe, D—these features being common to other types of carburettor. During the intake stroke the motor draws in a volume of air through the tube, A, which causes the sprayer at the same time to eject a quantity of petrol, the amount ejected bearing a relation to the degree of vacuum produced, and being adjusted to give proper carburation at a speed of 200 revolutions per minute, when no auxiliary air enters the mixing chamber. The mixture thus formed passes to the motor through the intake, U.

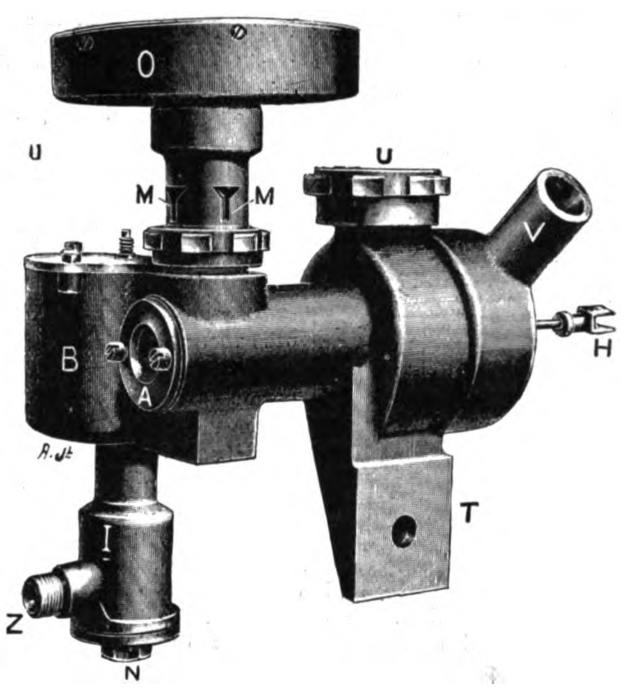


Fig 1—The Krebs Carburettor.

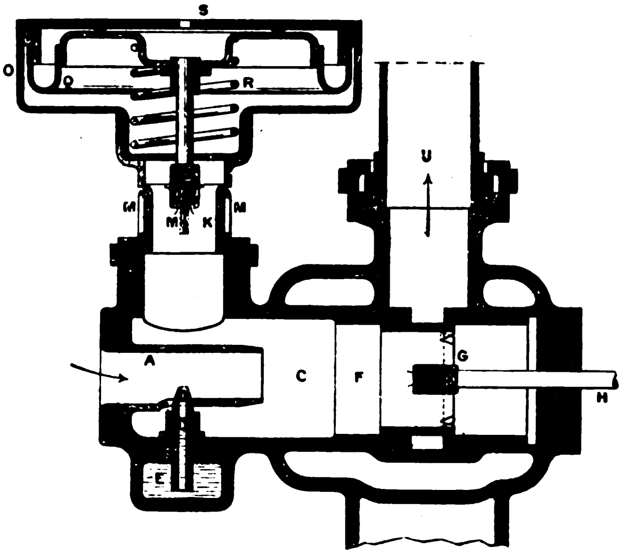


Fig. 2.—Section of Krebs Carburettor.

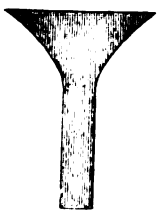


Fig 3.—Shape of apertures M.

The additional air required at speeds of the motor above 200 revolutions enters by the apertures, M, and joins the mixture already formed. The degree of vacuum produced in the carburettor by the intake stroke, due to the displacement of the piston, bears a direct relationship to the speed, apart from the effect of the throttle-valve, G, and it is this relationship which controls the degree to which the additional apertures, M, open. In order to effect this, the Krebs carburettor has a valve, K, resembling that employed for controlling the engine speed.

The ordinary throttle, G, which is horizontal, is controlled by a centrifugal governor of the ordinary type, and simply controls the admission of the explosive mixture to the cylinder. At one end it is provided with a number of V-shaped notches for the purpose of gradually opening the inlet, and permitting the supply of gas to pass into the intake progressively. There is nothing specially noticeable in this arrangement, and the illustrations sufficiently show the structure of this throttle, and the manner in which it may be actuated either by the centrifugal governor or by the driver, who can assist or diminish the action of the opposing spring in the usual way.

At starting the governor spring keeps the throttle fully open, and a full charge of mixture then enters the cylinder. The motor takes two or three vigorous explosions, and, its speed increasing, the governor comes into play, and by means of the rod, H, operates the throttle so as to close the intake. The throttle-valve, therefore, is, so to speak, a cock operated by the governor, and capable of being further controlled by the driver, according as he desires to increase or diminish the speed of his motor. The auxiliary air valve, K, is controlled by the amount of vacuum produced in the carburettor. Of course, it will be understood that the movements of this valve, K, correspond more or less with those of the throttle, as it is often owing to the action of the throttle that the variations of speed in the motor are produced, and they consequently determine the degree of partial vacuum produced in the carburettor.

This valve, K, is vertical. Its controlling rod is surmounted by a large disc, Q (Fig. 2), which is attached to the case, O, in which it is mounted by a flexible diaphragm of caoutchouc. The whole arrangement is air-tight, but a small aperture of about 2 mm. in diameter is bored at S, in the cover of the box, O, in such a way that when the disc, Q, is drawn in by the suction of the motor and retreats from the cover, the air enters comparatively slowly into the chamber, between Q and its cover, the volume of which increases as a part of its walls are in part formed by the caoutchouc diaphragm. Correspondingly, when the suction stroke has ceased the air which has entered passes out relatively slowly through the aperture, S, when the spring, R, brings back the disc, Q, to its original position. It is necessary that the disc, Q, should be of tolerably large size, in order that the valve, K, may move in correspondence with slight variations in the degree of vacuum produced. If the disc were smaller, slight degrees of variation of the vacuum would not produce sufficient effect. On the other hand, if the orifice, S, is too large, the movement of the disc in consequence of the opening of the apertures, M, would be too sudden and intermittent when the motor is running at high speeds, and would be too little acted upon by the spring owing to the inertia of the parts. In the arrangement adopted, on the contrary, the valve, K, is practically in unstable equilibrium, like the beam of a balance, one of the arms of which is subjected to the force due to the partial vacuum, and the other to the force of the spring. By making S of small dimensions a brake or dash-pot effect is produced which prevents hunting and vibration. Fig. 3 shows the shape which has been given to the apertures, M.

The new carburettor has thus very distinct characteristics as compared with those which have been previously employed, and they may be summarised as follows:—

The shape of the aperture for the entrance of the additional air, the form of which is mathematically exact, and has the effect of maintaining the admission and carburation constant and adequate, no matter what the variations in the partial vacuum may be.

The control by the vacuum itself of the valve which regulates the dimension of the aperture for the additional air.

The progressive breaking or dash-pot effect which is produced upon the diaphragm controlling this throttle by the gradual entry of the air through the small orifice above it. This prevents the throttle being affected by sudden alterations of speed or by jolting due to irregularities in the road surface.

The results obtained with this carburettor are of very considerable importance from a practical point of view. In the first place, it enables the carburation to be kept at its lowest possible limits. The driver does not need to trouble in any way about the carburation, either when starting or running, and it is independent of variations of temperature in the atmosphere. The carburation is always good, and if the ignition is in proper condition the motor always starts at the first turn of the starting handle. It enables the adjustment for additional air, usually mounted on the dash-board, and the feed of hot air to be completely suppressed, together with the resulting complications which even the most experienced driver can never succeed in adjusting except more or less approximately. The temperature at which the mixture is made is constant, as the mixing chamber is water-jacketed, as may be seen in the illustrations, and the water in its jacket takes part in the general circulation, and does not form simply a pocket off it. Freezing up is also rendered impossible. All these details form a very important improvement, obtained by very simple means, and this makes it of still greater value.

In the second place, the constant degree of the carburation at all speeds enables the motor to be run at a very small number of revolutions without losing the power of each stroke. For instance, if the change-speed lever be put on the third speed, which might give under ordinary circumstances a speed of 50 kiloms. an hour, and it is desired to run only at 10 kiloms. this can be effected by reducing the speed of the motor from 1,000 down to 200. The power of the motor when the speed is reduced from 1,000 to 200 is, of course, diminished, since it is proportional to the number of revolutions, but the power of each stroke remains the same, and this may be verified by means of a Prony brake. A considerable increase of flexibility consequently results.

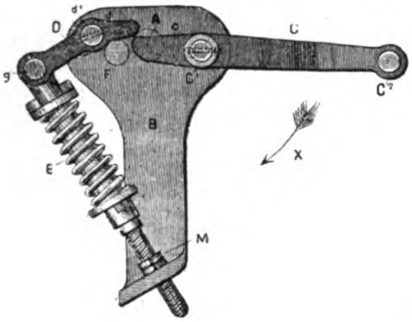
The new carburettor may be applied to every size of motor. The dimensions, of course, will necessarily be varied according to the power of the motor. Type No. 1 has the apertures, M, 12 mm. long, and is adapted for motors of 4 to 16-hp. In Type No. 2 the apertures are 4 mm. longer. This is suitable for powers of 16 and 40-h.p. Type No. 3 is designed for motors of 70-h.p., and has apertures of 20 mm. Applying the new carburettor to a motor requires no structural alteration.

The valve for the additional air will when working be observed to rise and descend behind the apertures, according to the number of revolutions the motor is making. If it is desired to employ carburettors for alcohol instead of petrol, it is sufficient to change the sprayer nozzle and replace it by a somewhat larger one.

THE DUCHÊNE "ANTICHOC" STARTING HANDLE.

MANY people have unpleasant experience of the effects of a premature explosion when starting their motor. The experience is not so frequent or so unpleasant as it used to be when tube ignition was universal, but even with electric ignition, if the position of the commutator happens to be incorrect for starting, trouble may occasionally occur: a severe jar in the wrist—and sometimes even a broken wrist—may be the result.

To avoid this unpleasantness a special starting handle has been designed by M. Duchêne, which we illustrate above. The illustration is almost self-explanatory. A is the end of the motor shaft, on which is fitted the plate, B. In this plate, B, the starting lever, C, with its handle, C^2, is pivoted at C^1. The end of this starting lever engages with the end, d, of a second lever, D, which is pivoted at d^1. At its other end the lever, D, is articulated with a rod, on which is carried a spiral spring, E. This spiral spring is mounted between two collars, by means of which, and the nut, M, working on the screw-threaded end of the rod with which D is articulated, the tension on the spring, E, may be adjusted.



The drive of the starting lever, C, takes place normally through the end, d, of the second lever, D. If during starting a back explosion takes place, the force comes on the spring, E, which is compressed, enabling the pointed end, d, of the lever, D, to raise and free the starting lever, C. The starting lever, C, may be again brought into engagement with D, by causing it to make one complete revolution about its fulcrum, C^1.

AT the Motor Cycling Club's first annual dinner, to be held at Frascati's Restaurant, Oxford Street, next Wednesday, the 14th inst., the chair will be taken by Mr. S. F. Edge. The dinner will be followed by a discussion on various subjects, including Classification—Handicapping—Weight *v.* Power; Efficiency Tests—Transmission and Ignition; Organisation of Motor Cycle Clubs; Fore-Carriage and Trailers; The Value of Pedals. Tickets and further particulars can be obtained from the Hon. Sec., Mr. G. E. Roberts, 17, Fieldhouse Road, Hyde Farm, Balham, S.W. The annual general meeting of the Club will be held on the 28th inst. In the meantime the weekly runs have for the present been suspended, owing to the uncertainty of the weather. The first run for next season is down for Saturday, 7th March, Brighton being selected as the destination. Mr. E. March, well known for over 16 years in connection with the Holborn Cycle Club, has been appointed treasurer to the club.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THREE-CYLINDER MOTORS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Has not your correspondent lost sight of the fact that we are dealing with four cycle explosive motors, not steam engines, in which turning moment and the balancing of reciprocating parts are of such vital importance. With cranks set at 240, in our opinion, there is nothing that balances much better.

Yours faithfully,
MAWDSLEY BROOKE.

Lowestoft, Jan. 5th.

THREE-CYLINDER CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Your correspondent is wrong in reference to the first public appearance of the Brooke car. This was at the Automobile Club meeting at Gunton Park, some time previous to the Show at the Agricultural Hall, but we had a motor in use twelve months before this, and, curiously enough, were experimenting with the use of the exhaust gases aud compounding in a very similar manner to your description on page 17 of last issue, and also as to the use of steam generated by two outside cylinders in the process of cooling and made use of in a middle cylinder. We obtained additional power from this, but not sufficient to make it a commercial business.

Yours faithfully,
MAWDSLEY BROOKE.

Lowestoft, Jan. 5th.

THE Coupes de Pioule Races, which take place on the 11th inst., have been officially authorised.

AN official course for trials of kilometre and mile records is likely to be selected by the Antwerp Automobile Club on Baron Cater's estate at Westwezel, where a straight run of about 5½ kiloms. is available.

MR. W. J. STEWART, of the A.C. of New Jersey (U.S.A.), is reported to have covered the Eagle Rock Hill, in New Jersey State, in the time of 1 min. 53 secs., on a steam car, thus reducing the best time by 50 secs. This is the hill where a contest was recently held, reported by us in our issue of 20th December. The timing is stated to have been official.

Motor Bicycle Track Record.—On the 3rd instant, on a 4½-h.p. motor bicycle, Maurice Fournier beat F. W. Chase's track record by one second at the Alexandra Palace Velodrome, his time being, with a flying start, 1 min. 40⅖ secs. for the mile.

THE following records made on the Dourdan road on December 9th have been officially noted by the A.C. de France:—Flying Kilometre (Motor Bicycle): Lamberjack, 39⅖ secs.; Flying Mile (Motor Bicycle): M. Fournier, 1 min. 5 secs.

THE A.C. de France have amended their racing rules, as follows:—If a driver passes a control without stopping for the period fixed by the organisers of the race, he shall be penalised a number of minutes equal to the total time of neutralisation, provided he can prove that the officials were not at their post; but failing this proof, the penalisation will be trebled. If, in the opinion of the judges, the ignoring of the control was intentional on the part of the driver, he may be disqualified.

Two Napier cars have been entered for the Circuit des Ardennes by Messrs. Mark Mayhew and S. F. Edge.

As we anticipated, a course for the Gordon-Bennett race *has* been found in Ireland which not only complies with the proviso that the route shall not be less than 95 miles without traversing the same ground twice, but exceeds this distance by some 30 or more miles. The course proposed is:—

	Miles.
Naas *viâ* Kildare to Maryborough	31¼
Abbeyleix	9¾
Ballyroan to Stradbally	11½
Go six miles south-east, then acute angle N.E. to Athy	14
Athy to junction with old road south of Kilcullen ...	11½
Kilcullen to Carlow	21
Carlow to Athy	12
Athy to Naas *viâ* Kilcullen	20
	131

Mr. S. F. Edge and Count Zborowski will "sample" this course next Monday, so that Mr. Johnson's recommendations may be endorsed. The surface of the road throughout is poor, although it is not worse than a portion of the Circuit des Ardennes road and the Gordon-Bennett course of 1902. Neither will the road allow of high speeds except in certain parts. On the whole, though, it should prove a good test for the competition. The only question now remaining is the one for which Parliament must be responsible, viz., the granting of a short enabling Act. The steps being taken by the Automobile Club are such that if there is the remotest possibility of the much-wished-for permission being granted no effort will be too great to obtain it. With the united action of the local authorities, Irish Members of Parliament, and last, but not least, the parish priests, there is just the chance that a short Act might be got through. We feel sure neither the Prime Minister nor the Lord Lieutenant of Ireland will throw any obstacle in the way. We sincerely trust, therefore, that the efforts of the Club and all who have worked to this end may be attended with success.

Should Mr. H. S. Harkness be selected as one of the representatives of America for the Gordon-Bennett Cup race, he will drive a new make of car which is being specially constructed for him. The rumours of his driving either a "Peerless" or "Winton" are, therefore, not well founded. The Matheson machine, which is being built at Grand Rapids, also with a view to running in the race, will, it is stated, have four 8 by 10 cylinders, developing 150-h.p.! Two of these vehicles are to be constructed, Mr. J. B. Hedges being nominated by the Matheson Motor Car Company as one of the drivers.

Various devices for reducing the tendency of motor tyres to sideslip, we are advised, are being experimented with by the Dunlop Company in England and by other firms abroad, but the importation of such devices in most cases, it is stated, constitutes an infringement of the Dunlop Pneumatic Tyre Company's patent rights. For the convenience of their customers, however, the Dunlop Company have expressed their willingness to procure such non-slipping devices if possible, or to receive them direct from their customers, and to fit them to Dunlop motor tyres where they can be applied, merely charging customers with the actual cost of so doing. In making this offer the Dunlop Company assume no responsibility for the effectiveness of the non-slipping devices, but merely undertake to properly fit them to their tyre.

Vice-Admiral Sir John Fullerton, Groom-in-Waiting to the King, has just acquired a Beaufort car.

A White steam delivery van is under trial by the London postal authorities. At present it is operating in the Battersea district.

One of the 1903 Beaufort models will be a 4-cylinder car with mechanically operated inlet valves, honeycomb radiator, and magneto ignition.

The Automotor Journal stand at the Stanley Automobile Exhibition, opening at Earl's Court on the 16th inst., will be No. 34 in the Queen's Palace.

Mr. H. F. Joel, A.M.I.C.E., will read his paper on "Electric Automobiles" before the Institute of Civil Engineers next Tuesday, the 13th inst.

New show rooms and stores, centrally situated at 45, Great Marlborough Street, London, W., have been acquired by the United Motor Industries, Limited.

Osmond's, Limited, after losing £42,630 over a period of six years, propose reconstructing under a very drastic scheme put forward by the Board of Directors.

Several of the motor omnibuses which are shortly to ply in London are to have special smoking compartments, so arranged as to cause no inconvenience to non-smokers.

"The Weston Motor Syndicate" is the new title of Weston Motors, of 14, Mortimer Street, W. Last week, by a printer's error, the word Weston was spelled "Western."

A straight-speed course of about 1¼ miles has been located near Chester, and it is possible that permission will be granted to the Automobile Club for holding speed trials.

Before the Cycle Engineers' Institute, Birmingham, on Friday this week, Mr. B. A. Hunt was announced to read a paper, entitled "Important Features in the Scientific Designing of Motor Cycles."

To take the place of a service of antiquated horse-drawn omnibuses, which has been recently discontinued between Cheadle and Didsbury, motor omnibuses have been started, and are finding much favour.

Lord Rosebery's son, Lord Dalmeny, whose coming of age was celebrated with so much enthusiasm on Thursday, was on Monday last elected a member of the Automobile Club. Lord Dalmeny's name was the first on the 1903 list for election.

A unique calendar for 1903 has reached us from the Collier Twin Tyre Company, Limited, in the shape of a gilded tyre, on which the sizes of this make of tyre are given both in inches and millimetres, rendering it handy for desk reference.

Motor pacing for bicyclists promises to become more general during the coming season. Tom Linton, who scored sensational times last year, proposes using two pacing motor bicycles, viz., one of 18-h.p. with four cylinders, and the other of 12-h.p. with two cylinders.

Extensive new premises have been acquired in Arlington Street, Camden Town, by the Carl Oppermann Electric Carriage Company, Limited. New machinery, electrically driven, is being installed, the capacity of the works being one electric car per week.

The conference of makers and sellers of motor cycles will be held at the Automobile Club next Tuesday, the 13th inst., at 5 p.m. The purpose of the meeting is to consider what (if any) trial of trustworthiness of motor cycles shall be organised in the year 1903.

We regret to hear of the death, in Egypt, of Mr. Joseph Lucas from typhoid fever. Mr. Lucas was the head of the well-known Birmingham firm of that name. His loss will be felt in the cycle industry and his personality greatly missed in the city of Birmingham.

Mr. Kenneth R. Balfour, M.P. for Christchurch Division, was married last week to Miss M. E. Broadwood, daughter of Col. A. Broadwood, late of the Scots Guards. Mr. and Mrs. Balfour's honeymoon trip will take the form of a motor car tour through Cornwall and Devon, starting from Bath.

His Majesty the King has again demonstrated his confidence in British-made goods by ordering through Mr. Oliver Stanton another 22-h.p. Daimler car for the 1903 season. It is hoped that this identical vehicle may be ready in time to be exhibited at the Crystal Palace Automobile Show opening on the 30th inst.

At the second dinner of the Society of Motor Manufacturers on Wednesday next, the 14th inst., at the Hotel Cecil, the subject of the discussion following the dinner will be "The Paris Salon of 1902 (General, Commercial, and Technical)." At a meeting of the Society, held last week, it was decided to approve, in principle, the Light Van Trials proposed to be held under the auspices of the Automobile Club. A committee was formed for consideration of various points in connection with the proposed trial.

In consequence of the dispute between the railway authorities and the Crystal Palace management the pleasures of a visit to Sydenham Hill are not likely to be increased in the future. Through-booking by the railway company has been withdrawn, so that, in addition to the present miserable railway service, visitors for the future will be mulcted in an additional sixpence upon the price hitherto charged for combined railway ticket and entrance fee. Hope is still entertained that a *modus vivendi* may be arrived at.

Joseph Lucas, Limited, the well-known Birmingham makers of bicycle accessories, have for some time made a strong feature of introducing, month by month, various accessories and almost indispensable novelties for automobilists. They have now made an important new departure in the same line by preparing for the coming season, under the title of "King of the Road," a special make of lamp suitable for motor vehicles. This will be made in various sizes and styles, and will show a very marked and important reduction in cost on motor lamps hitherto offered to the public.

With commodious premises in Jesus Lane, Cambridge, the Cambridge University Automobile Club has been recently formed. The club premises will include an inspection pit, repair shop, an up-to-date garage, a competent mechanic and staff being in attendance for the convenience of members. Past and present members of the University are eligible for election. It is hoped to have the premises open by the first day of next term; in the meantime, all information may be obtained from Mr. Hugh H. Gregory, St. John's College, Cambridge, who has undertaken the duties of secretary.

Next Friday, the 16th inst., the Stanley Automobile Exhibition at Earl's Court will be opened to the public, remaining open till the 24th inst. On the previous day—the 15th—the formal opening ceremony will take place, Sir Albert K. Rollit, M.P., taking the Chair at a Press luncheon to be held in the building. It is announced that cars and motor cycles can be run in the grounds between the Ducal Hall and the Queen's Palace, a distance of about 220 yards. The Anglo-American Oil Company have arranged for a special depôt in the grounds adjoining the Ducal Hall for the sale of petrol.

The Weston Motor Syndicate, 14, Mortimer Street, Regent Street, W., have been appointed sole agents for Great Britain and the Colonies for the Chenard and Walcker motor carriages. The first models of this make will be seen at the Weston Motor Syndicate's stand (No. 162) in the Concert Room of the Crystal Palace during the Automobile Exhibition opening there on the 30th. From that date forward a good stock of these carriages will be regularly in hand at the Syndicate's Mortimer Street show rooms. We noted several features of these cars during our visit to the Paris Salon, and our readers have, no doubt, seen mention of them by us on several occasions. We shall be dealing more fully with the entire system in an early issue.

A regular automobile service has been recently established in Italy between the two towns of Spoleto and Norcia, the initiative having been due to the Municipality of the former town, which is very enterprising and up-to-date, and has already organised the water supply and lighting in a satisfactory and modern way. An automobile now starts from Spoleto for Norcia every morning, another vehicle commencing the return journey from Norcia at the same time, so that the two meet each other on the road. Norcia is 18 kilometres from Spoleto, and as it is situated some 730 metres above it, the speed attained on the one journey is not very great. The automobiles employed for the service are of the large steam omnibus type, each being capable of carrying 20 travellers and four officials. Norcia, an old town, the principal industry of which is pork sausages, famous ever since Roman times, is very enthusiastic over the new development, as it has previously been very much shut off from the world owing to its position. It is now, owing to the automobile, brought much nearer to the general stream of commerce and progress than it ever has been before.

THE 1903 Antwerp Automobile Exhibition has been abandoned.

A HILL climb and speed mile contest is being arranged to take place at Maestricht in May.

THE King of Spain has accepted the Honorary Presidentship of the Spanish Automobile Club recently formed in Madrid. The Committee will include many of the most influential nobles in Spain.

AN attempt by the Baltimore Park Commissioners to exclude automobiles from certain districts controlled by them has been ruled, by Justice White of that city, to be beyond their powers, and contrary to the city statutes.

THE Swiss postal authorities are experimenting with automobiles for overcoming the difficulties experienced in dealing with the mails by means of horse-drawn conveyances. A regular motor car mail service for this purpose will be inaugurated in the spring, in one of the worst-served districts.

ACCORDING to an American automobile contemporary, E. J. Pennington has succeeded in "mesmerising a few people in Detroit, Mich.," where he is doing business as the Anderson Carriage Company, which is represented to be the Detroit agency of the American Automobile Company, Racine, Wis., with head offices in London and Paris.

AN important new building in New York, planned exclusively for automobiles, is to be erected on Upper Broadway, principally to deal with the commercial draught vehicle. The Rainier Company are projecting this scheme, and will handle the output of the Vehicle Equipment and the Berg Automobile Company. An extensive garage will also be attached to the building.

AN indication of the strides being made by the automobile in America is given in the special number of the *Scientific American* just issued, in which, in addition to a large number of automobile advertisements scattered throughout this well-known publication, on the coloured wrapper, out of fifteen advertisers occupying the four pages, no less than eleven deal with automobiles.

"BUTLER *Watched* at Dinner." For a moment, when this headline caught our eye, visions of petty larceny rose up before us; but upon investigation it resolved itself into the method adopted by an American paper for recording the fact that Secretary S. M. Butler, of the A.C. of America, had been presented, at a dinner of the New York Athletic Club, with a very handsome gold stop-watch as a mark of appreciation of his services in connection with the American Reliability Trial.

SEVERAL American automobile concerns are largely extending their premises. Amongst these the Peerless Motor Car Company, of Cleveland, although they recently added over 12,000 feet of floor space to their premises, are already contemplating further extension. The Boston branch of the Locomobile Company of America has also had to remove into a larger building at 13 and 15, Berkeley Street, Boston, these premises having been specially fitted for the automobile business.

"THE Motor Cars Regulation Act (1902)" is the short title of a new Act in New Zealand, which repeals the McLean Motor Car Act of 1898. The Act covers any vehicle propelled by mechanical power not exceeding in itself three tons in weight unladen (exclusive of water, fuel, or accumulators), or if used, to propel not more than one other vehicle, the combined weight of the two not to exceed four tons unladen. Smoke, except from temporary or accidental causes, must not be emitted. Where power to make special bye-laws regulating the use of vehicles of any description exists with the Governor, the Minister for Public Works, or the local authority, they shall have power to make bye-laws regulating the use of motor cars upon bridges or other places where risk of damage to the bridge or danger to the public is likely to occur, to regulate the keeping and use of petroleum or other explosive required for fuel. Any bye-laws so made must first be approved by the Colonial Secretary. All motor vehicles must exhibit a white headlight, and carry a warning bell or other similar instrument, and motor vehicles must not travel along a road, street, or highway at a greater rate than is reasonable. Annual inspection of every motor car exceeding 100 lbs. in weight is provided for under the Inspection of Machinery Act, 1892, and the provisions of that Act apply, except that in the case of motor cars not used for hire, either for passengers or goods, it shall not be necessary to employ a certificated driver.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Fothergill and Co. (Limited), 53, Victoria Street, S.W.—Capital, £2,000 in £1 shares. Object, to carry on business as builders of motors, motor cars, and electrical machinery, &c.

General Autocar Insurance Company (Limited).—Capital, £100 in £1 shares.

Igel Engine Syndicate (Limited).—Capital, £50,000 in £1 shares. Object, to acquire certain inventions relating to reciprocating rotary engines from H. Igel, of 89, Side, Newcastle-on-Tyne, and to carry on the business of mechanical engineers, smiths, metal workers, machinists, motor car, cycle, launch, and carriage builders, &c.

Xpress Motor and Vehicle Manufacturing Company (Limited), 180, Stockport Road, Manchester.—Capital, £2,000 in £1 shares. Object, to adopt an agreement with T. Clarke, and to carry on the business of manufacturers of and dealers in motor carriages, cycles, vehicles, &c.

NEW INVENTIONS.

Claiming particularly to apply directly or indirectly to Motor Vehicles, &c.

Patent Specifications Published.

Applied for in 1901.

Published January 15*th*, 1903.

18,862. C. TUCKFIELD. Aeronautical machine.
19,070. F. W. LANCHESTER. Motor vehicles.
19,159. F. W. LANCHESTER. Fluid pressure engines in part relating to power-propelled vehicles.

THE AUTOMOTOR JOURNAL

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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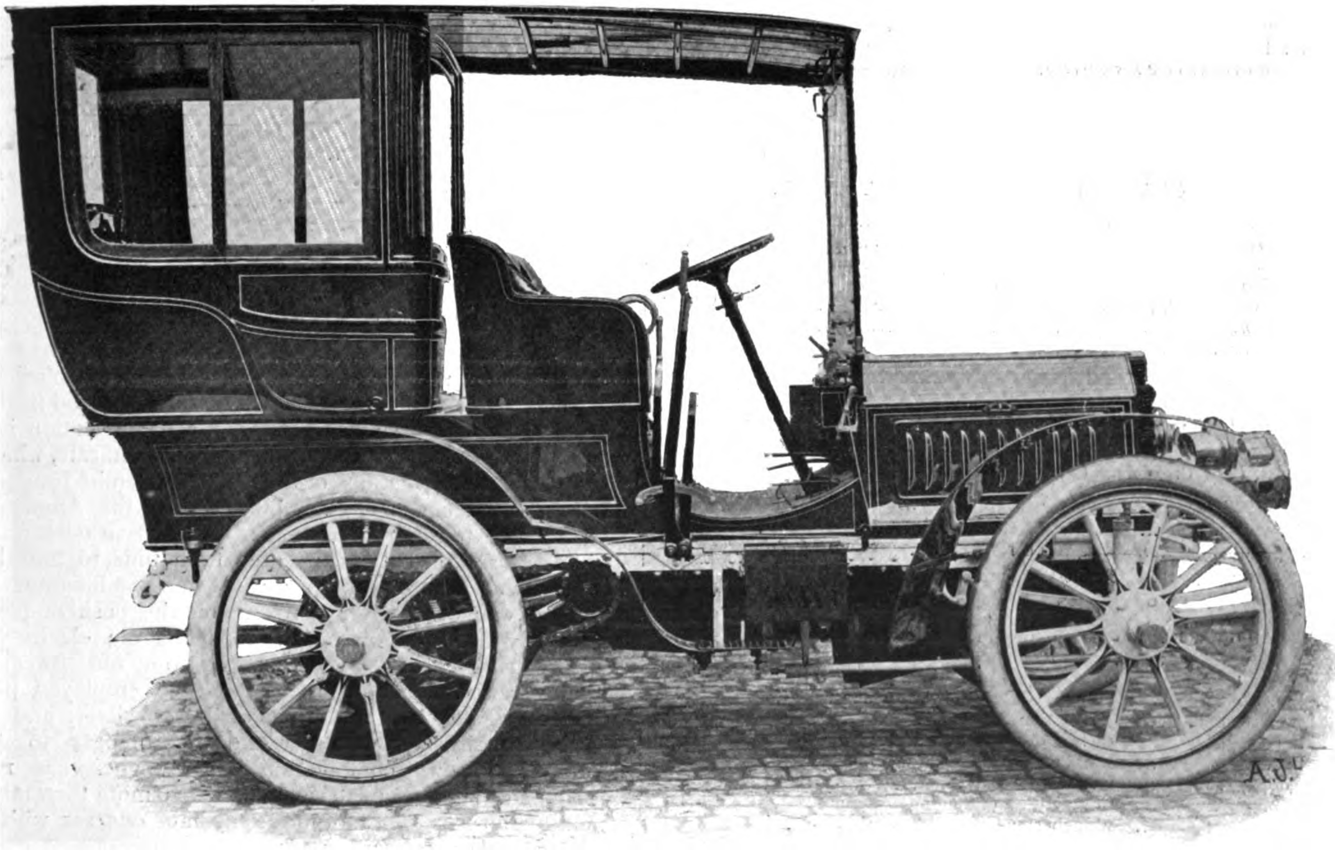
No. 106. (No. 3, Vol. VIII.) JANUARY 17TH, 1903. [Registered at the G.P.O. as a Newspaper.] [**Weekly, Price 3d. Post Free, 3½d.**]



A 15-H.P. GERMAIN PETROL CAR—WITH TOURIST BODY.

THE AUTOMOTOR JOURNAL.

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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to The Editor of "The Automotor Journal," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.	
August ...	... Tourist Motor Bicycle Reliability Trial.
September	... The 1,000 Miles Trial.
1904	... Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
Jan. 16–24	... Stanley Club Motor Show at Earl's Court.
Jan. 30–Feb. 7	... Exhibition, Crystal Palace.
Feb. 3–7...	... Liverpool Cycle and Motor Show.
Feb. 6–14	... Edinburgh Motor and Cycle Show.
Feb. 7–16	... Brussels Automobile Salon.
Feb. 9 ...	... Competition of Timing Apparatus (A. C. de F.).
Feb. 13–21	... Manchester Cycle and Motor Show.
Feb. 19 ...	... Consumption Trials (100 kiloms.) *L'Auto-Velo.*
Feb. 22–28	... Pau Automobile Week.
March ...	... Competition of Silencers (A.C. de F.).
March ...	... "Criterium du Quart de Litre" (*L'Auto-Velo*).
March 1–15	... Berlin Automobile Exhibition.
March 16–30	... Vienna Automobile Exhibition.
March 21–28	... Cordingley and Co.'s Exhibition, Agricultural Hall.
March 21–28	... "Criterium des Transports Automobiles." 1,095 kiloms. (*La France Automobile*).
March 28–April 5	Nice Automobile Week.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 24 ...	... Paris–Madrid (A.C. de France). Entries until May 15. Double fees April 16 to May 15.
May ...	... Gordon-Bennett Cup Race.
June 22–24	... Automobile Club Fêtes—Paris.
July 5–12	... Aix-les-Bains Auto Week (Auto Club du Rhone).
July ...	... Circuit Francaise. 400 kiloms. (Chambre Syndicale de l'Automobile).
August ...	... Circuit des Ardennes.
Oct. 15–21	... Leipzig Exhibition.

Index to Vol. VI. (October, 1901, to March, 1902) is issued free with the current number.

Next week Index to Vol. VII. (April to December, 1902) will be given. The intentional delay in publishing the Index to Vol. VI. is due to suggestions received from many readers that that volume, consisting of six monthly numbers only, should be bound up with Vol. VII. The publishers have, therefore, met this view, and are issuing the Indexes to Vols. VI. and VII. separately, so as to enable those who prefer it to keep their volumes distinct.

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PASSING EVENTS.

EDISON'S BATTERY—THE LATEST.

The multitudinous discussion on the Edison battery seems to have recently assumed a different complexion. We understand from an article which has appeared in the *Nya Dagligt Allehanda* that his American application has encountered the opposition of the Jungner Syndicate, which is exploiting the inventions of the Swedish chemist Jungner, and has, in consequence, been put in what the American Patent office terms "interference." We have dealt with various classes of battery invented from time to time by Mr. Jungner, and particularly with the combination in which he employed silver peroxide on the positive plate with finely divided iron on the negative, the electrolyte being caustic alkali. It appears from our Swedish contemporary that he at the same time employed peroxide of nickel to replace peroxide of silver, and if this be so there certainly would not appear to be much of Edison's combination that Jungner has not anticipated. He appears to have attained to more than mere laboratory anticipation, too, for at any rate one car with a Jungner battery on board was running in America as early as the summer of 1900, and is said to have covered a distance of 148 kilometres on a single charge. The question will ultimately, we understand, be decided by the American jury of experts usual in such cases, but in the meantime the importance which has been attributed by one side to the "flakiness" of the graphite is a little amusing, as that graphite is ever anything else but flaky has yet to be discovered. For the present we only give these statements on our Swedish contemporary's authority. If the American Patent Office ultimately refuse the grant to Edison it will be a serious commercial blow for the prospects of his battery. We have always deprecated the amount of injury that has been inflicted on legitimate accumulator manufacturers by the reckless propaganda that has been made in the daily Press on behalf of the new Edison battery. If it ultimately appears that the application is thrown out by the American Patent Office on the ground of want of novelty or a prior application by another inventor, the behaviour of the daily Press in the matter will be more than an abuse of their position—it will be an absolute scandal. We believe the amount of puffing that the Edison battery has been subjected to in this country is not altogether Edison's fault. When his ore separator company was floated some little time back, a great deal of influence was brought to bear upon the daily Press in this country with reference to it. It was floated very satisfactorily, and that after the appearance of only a few short paragraphs about it. Shortly after that the new Edison battery was announced, and immediately all the papers which had praised the ore-separator commenced a chorus of adulation in favour of this the latest Edison invention. We believe that this was quite as much from a lively sense of gratitude for past favours as from any expectation of favours to come, but its effect on the trade has been prejudicial all the same.

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Our Swedish contemporary prints its article in English, a somewhat unusual procedure in Swedish papers, and suggestive of inspiration in a particular sense, so we do not, as already explained, take any responsibility for its statements. We have, however, derived much innocent enjoyment from some of the phraseology employed, and we cannot refrain from submitting a few specimens of it for the entertainment of our readers. The following are some of the flowers of expression:—"Spongy lead-plates and diluted sulfuric acide are tender, and show after a short times use very bad complaints. They have, too, a very small effectivity, *i.e.*, they weigh very much compared with the amount of electricity they can hold and they are very easely spoilt by wrong treatment." "Whole the system with lead plates is to be given up; the question is to find plates and a liquide such, that the plates are at the same time insoluble in the liquid and active for the stream; the liquid must stay unchanged." "The Patent Office of the United States has not agreed to Edison's claims, but has made him several disagreable questions." Whatever may be the rights and wrongs of the controversy, we trust our Swedish contemporary will continue to publish technical or semi-technical articles in this delightful imitation of the English language, and send them to us at frequent intervals. A book of selections from them would, we feel sure, command a wide sale, and recall the days of that immortal publication, "English as she is Spoke." The world is getting rather matter-of-fact, and every source of innocent enjoyment and amusement should be sedulously cultivated. We look forward with pleasure to our contemporary's further efforts in the same direction.

BARON ROTHSCHILD'S PAPER.

The reading of Baron Henri de Rothschild's paper at the Automobile Club—the first of the series of after-dinner papers of this season—was a very festive business. He realised the happy knack of putting before his readers with much humour and many reminiscences the lighter side of automobilism. There was much appropriateness in selecting the Baron as the reader of the first paper of the series. Few people have taken a more sportsmanlike or more enthusiastic interest in the automobile movement than he, and still fewer have made greater sacrifices of time and money in its behalf. He is one of the well-known figures of automobilism, and a popular one at that. Fate often has its little ironies, particularly for the automobilist, and the occasion of Baron Rothschild's paper is no exception. Just about the same time as he was reading it, amid the laughter and plaudits of the Automobile Club of Great Britain, he was being fined sixteen shillings by the Paris authorities, and sentenced to three days' imprisonment for furiously driving an automobile in the French capital. We understand that where these sentences of imprisonment are inflicted on the other side of the Channel, they are made very unpleasant for the victims, for they are inflicted by the magistrates by a sort of tacit understanding with the police, who are said to make a fairly good thing out of the automobilist in consequence. So, perhaps, we shall have the pleasure of seeing Baron Henri permanently settled down amongst us, since imprisonment is an experience most people try to avoid, and the higher their social position the more anxious they are to avoid it.

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THE R.I.A. PROSPECTS OF REALISATION.

We have dealt with the work of the Roads Improvement Association from time to time, and with most of the proposals which have been suggested by them we have, as a rule, been in hearty agreement. No class of the community are likely to be benefited by the suggestions they have made and the proposals they have put forward more than automobilists. It is, therefore, with much satisfaction that we learn that the Government are very sympathetic towards the endeavours of the Association to procure more adequate highway accommodation for the country in general, and particularly for the Metropolis. The Local Government Board has now settled the terms of reference to the Departmental Committee on Highway Administration. The "sufficiency" of the roads in England and Wales, that is to say, their capacity for accommodating the traffic with which they have to deal, is to be one of the matters on which they are specially instructed to take evidence. This question of the "sufficiency" of the roads, or rather their insufficiency, has been one of the subjects on which the Roads Improvement Association have most persistently agitated during the past, and this reference to the Committee is therefore satisfactory evidence that their energy and initiative have produced an effect. In one respect the present Government have set a very good example. Their appointment of a Committee to inquire into the working of the Patents Acts was very quickly followed by the introduction of legislation in accordance with the recommendations of that Committee. We may hope, therefore, with some degree of assurance that the labours of the Committee on Highway Administration may be followed at an early date by a similarly satisfactory result. It is particularly in the neighbourhood of larger towns, and more especially in the outskirts of London, that road accommodation is so miserably inadequate. Country roads are often sufficient. All automobilists ought, therefore, in our opinion, to do what they can to support the Roads Improvement Association, both by speech, in the Press, and if possible, by giving evidence before the Committee. They will be the chief beneficiaries, and should therefore be the prime movers.

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COMMON-SENSE, AND WHY IT IS SOMETIMES ABSENT.

Sheriff Lee, of Forfar, to whom we have referred before, is a singularly open-minded and sensible administrator of the existing unsatisfactory law. In refusing to penalize a motorist who admitted travelling at about sixteen miles an hour, Sheriff Lee stated that he must repeat what he said on a former occasion, that this was an Act which must be administered with common-sense. In the present case, though there had been a technical breach of the Act, it was not necessarily such a breach as the police were bound to take notice of. Where the legal speed was exceeded in places where it could do no harm, he regarded such a technical breach of the law as one to be taken no notice of, while there were circumstances under which driving up to the legal limit was really dangerous and deserving of punishment. This is a sensible and rational view. After all life would be impossible, both for ordinary individuals, for magistrates, and for police—a state of things we should be sorry to see—if every technical breach of existing statutes were to be relentlessly prosecuted and published. There is the well-known nuisance of the tradesman's unattended cart. If the driver of every unattended cart were haled before the magistrates, those functionaries would have but little left of that ample leisure which enables them at present to be such picturesque adornments of the counties in which they reside. If the Lord's Day Observance Acts of Elizabeth and Charles II were to be similarly enforced (they are not repealed), each one of us who omits to attend divine service on Sunday in a Church of England place of worship (none others will do) could be brought before the magistrates and fined ten shillings, while the manufacture of steel and iron would be impossible, as blast furnaces and open hearth furnaces would have to be stopped on Sundays, and after a stoppage of that kind it would take about four days to get an open hearth furnace in proper working order, and very nearly a week to repair the damage that would accrue to a blast furnace, and by that time it would be necessary to repeat the injury once more. Common-sense is therefore recognised as a proper ingredient in the administration of statutes so widely different as those regulating large industries and the proceedings of tradesmen on their rounds. It is interesting to inquire why the one statute which affects the automobilist is allowed to form an exception. We believe the reason is that he is such a nice person to fine, and that according to the statute he can be fined as much as £10. He never goes to prison in default of payment, and according to the Act of 1896, he is generally amenable to a heavier fine than is thought adequate punishment for most high road offences. The tradesman cannot be fined more than 40*s*., nor the furious driver of the hippomobile. Now fines inflicted in Petty Sessional Courts go to reduce the rates, and magistrates are pretty large ratepayers. They have therefore a direct interest in fining as many of the class who are as certain to pay up as possible, for this will save their own pockets and those of their friends, and not very indirectly either. That this is one explanation of the many police traps in certain counties, and of the absence of consideration, common-sense, and sometimes even of decency with which the law is administered against automobilists is only too probable. And it is a scandal that it should be so. The Automobile Club have got their hands full at present with the question of legislation, but as soon as they have time to go into the matter they might make a worse move than agitating for a measure to enact that police court fines in future should go to the Imperial Exchequer and not to the diminution of local taxation.

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A LAUGHABLE CASE.

We have often had something to say about the funny way in which magistrates administer the law—of the way in which they interpret everything whenever possible to the disadvantage of the automobilist—and even stretch the interpretation of evidence to the greatest possible extent in his despite. We suggested in the last paragraph an explanation of these methods differing from and additional to the prejudice usually put forward. It is not often, however, that we encounter a flagrant illegality. Such, however, appears to have been committed at the Petty Sessions, Farnham. Miss Mangles was driving a steam car. The car, as is the custom with some of them, emitted visible vapour, and the ever-watchful police constable in this case, not inappropriately named Stringer, took out a summons against her under the Locomotives Act of 1865 for allowing steam to be emitted from a locomotive—to wit, a motor car. We can hardly believe there is a Justice of the Peace, great as very frequently is their exhaustive ignorance of the law, that is unacquainted with the Locomotives on Highways Act of 1896—that Act which has conferred so much importance upon them and not infrequently affords them opportunities of gratifying those feelings towards their more progressive neighbours which country gentlemen sometimes entertain for one another—particularly if they have adjoining coverts. Now the first section of this Act says, "The enactments mentioned in the schedule to this Act, and any other enactment restricting the use of locomotives on highways, and contained in any public, general, or local and personal Act in force at the passing of this Act, shall not apply to any vehicle propelled by mechanical power if it is under three tons in weight unladen." We may be quite certain Miss Mangles' car did not weigh three tons, and the conviction therefore is preposterously illegal. We suffer so much from the literal manner in which the Act is frequently administered that this absolute defiance of it is not to be tolerated. The magistrates of Farnham will be resurrecting the man with the red flag in all his glory next. It is true Miss Mangles was only fined 1*s*. and 9*s*. costs, but the illegality is just as great as if she had been fined a hundred pounds, and we certainly think that, in the interests of the general body of automobilists, steps to quash this conviction should be taken by the Motor Union.

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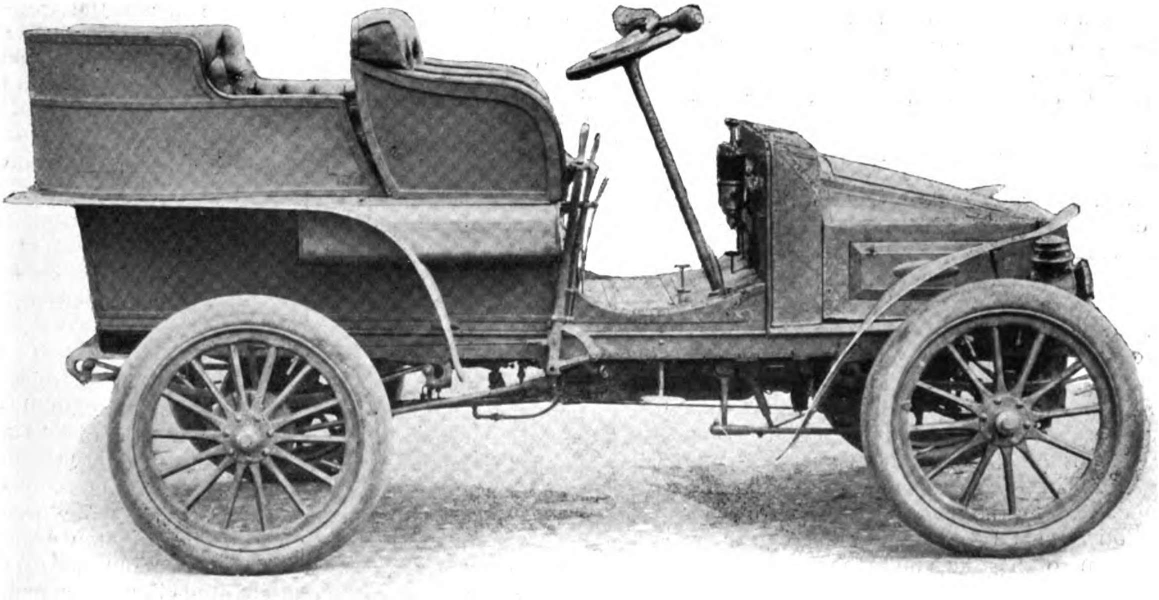
The Midland Automobile Club held their first annual dinner at Birmingham last Saturday, Mr. J. Broughton Dugdale, the president, being in the chair. During the evening the medals won in the competitions at Gorcott and Weatheroak Hill were distributed. Members were interested also to see on exhibition the cup which was presented by Mr. J. A Holder, and was won by Mr. Harvey du Cros, jun., in the competition on Sun Rising Hill, near Banbury.

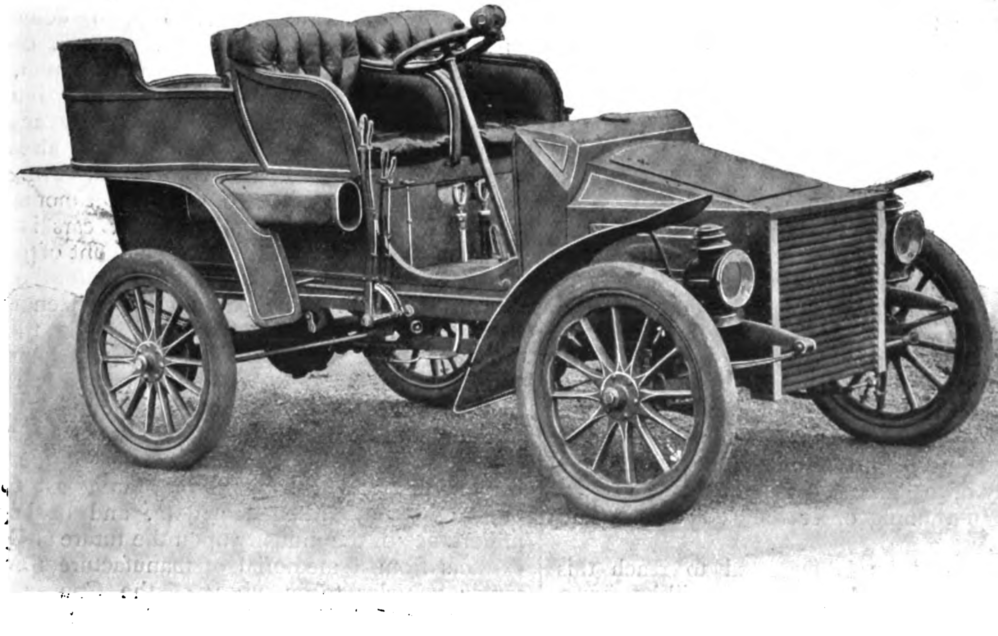
THE WHITE STEAM CAR—A NEW MODEL.



Side View of the new White Steam Car.

The makers of the White steam car are essentially progressive. They have followed up the successes secured by their justly popular and well-known light steam cars, with a vehicle which is sure to appeal even more thoroughly to motorists in this country. Their special system and their previous model were fully described and illustrated by us in our issues of November 1st and November 8th last, when we pointed out the many strong points resulting from the adoption of their unique system. In the new model a further development has been made, though the system remains the same. The chief differences are that a compound engine is employed, that the vehicle accommodates four passengers instead of two, and that its general construction is closely in accordance with the latest European practice.

The appearance of the car is seen in the two illustrations which we give. At first sight the vehicle might easily be mistaken for an up-to-date petrol car. The engine has its two cylinders arranged vertically, and the crank-



The new White Steam Car.

shaft lies longitudinally. It is fixed beneath the bonnet in front, and the power is taken from it through a universally-jointed propeller-shaft to a live rear axle. The back axle is not unlike those which are well known to our readers, bevel wheels, enclosed in the same casing as it, being used for driving the differential. The same sized boiler is used as before. It is placed beneath the front seat, and the exhaust gases find their way out on each side of the body; the flues through which they pass to atmosphere are seen in the illustrations.

The additional power available is secured by the employment of the compound engine in place of one of the double high-pressure type as hitherto, and this renders a larger boiler unnecessary. The fuel and water consumption should therefore be practically unchanged, although 50 per cent. more power is obtained owing to the steam being further utilised in the low-pressure cylinder. The nominal power of the engine is ten horse, and we are told it has shown itself capable of developing more than this power continuously when supplied with steam from the boiler used with it on the car. The exhaust steam is led to the condenser in front, and the water from it is, as before, pumped back to the main tank.

It will be noticed that two side levers are fitted as in a petrol car; the one of these acts upon the reversing gear and enables the cut-off of the engine to be varied, and its direction of rotation to be changed; the other lever operates side brakes acting upon the hubs of the rear wheels. We are not quite sure as to the position of the throttle-valve, but believe that it is controlled by a hand-wheel arranged above the steering-wheel, and mounted concentric with it. The steering pillar is surmounted by a wheel, and is fixed in an inclined position. The steering gear resembles that usually employed on European cars. The lubricators and gauges are fixed to the dashboard, and the two hand pumps project upward from the footboard on the driver's left. The small vertical spindle, terminating in a small hand-wheel, seen to the right in the footboard, is connected with the valve which the driver closes to shut off the petrol from the burner when the car is brought to a standstill. A foot-brake, which acts upon the longitudinal shaft, is provided; the pedal operating it is placed to the right of the steering pillar. The stop valves for shutting off the pipe connections to the two hand-pumps are controlled by small hand-wheels mounted above the floorboard, within easy reach of the driver.

The body is of the high-backed tonneau pattern, and the two front seats are divided off from one another as seen in the illustrations. The main frame is suspended on semi-elliptic springs, front and rear, and there are distance rods on each side of the car, between the rear axle and the main frame. The wheel base is 6 feet 8 inches and the tread 4 feet 8 inches. All four wheels are of the same size, they are of the artillery type and are 30 inches in diameter. Pneumatic tyres, 4 inches wide, are fitted.

The water and petrol tanks are neatly arranged so as not to interfere with the appearance of the vehicle, and we believe we are correct in saying that one of them forms the dash. The capacity of the former is 15 gallons, and of the latter, 10 gallons. In running order the vehicle is said to weigh about 15 cwt.

The first of these vehicles is expected to reach this country in a few days, and it is hoped that it will be shown at one of the forthcoming Exhibitions. We understand that a few of them have been thoroughly tested during the past year, so that it may be safely said that this new model is far from being of an experimental character. It will be placed on the market in this country at £400, and we learn that the manufacturers have made the necessary arrangements in their works for turning out about fifteen cars a week. We also understand that the previous model wlll no longer be made, but will be entirely replaced by the new model.

We are glad to see that the originators of this excellent steam system have shown themselves so thoroughly alive to the requirements of automobilists. Whilst wishing them the success which they deserve, we would express our hope that they will see their way in the near future to make yet one more step in advance by rendering their cars suitable for use with kerosene instead of gasoline as their fuel.

THE proposition to have a three days' Exhibition and kilometre speed trials at Brighton is maturing rapidly. At the Society of Motor Manufacturers and Traders' Dinner, held at the Hotel Cecil, on Wednesday evening, the matter was discussed by those present. The suggestions put forward, through the Automobile Club, for the event are that the Exhibition shall be held at the Brighton Aquarium —where there is accommodation for about 90 cars—on Feb. 12th, 13th and 14th, and that the kilometre speed trials should take place on Saturday, February 14th, in the Madiera Road, which is sufficiently wide to allow two cars to race side by side, and which affords facilities for spectators to view the races. The Corporation, represented by Councillor Carden, are inclined not only to close this road temporarily for the purpose, but to repair and roll the surface, so that the best results could be obtained by the cars. If these arrangements are satisfactorily concluded, it should prove of considerable value to the automobile movement, and at the same time provide a splendid entertainment for Brighton.

AN important Blue Book has been issued by the Automobile Club upon the Law as to Motor Vehicles; What it is and what it should be. This embraces important speeches by the Right Hon. Henry Chaplin, M.P.; The Earl of Onslow, G.C.M.G.; Sir Francis Jeune, K.C.B.; Mr. Ritchie; and others upon this very acute problem. Practically the whole of the matter has already appeared from time to time in the columns of THE AUTOMOTOR JOURNAL, but the re-issue of the present moment, when the question of further regulating motor cars is so much in evidence, should do an enormous amount of good amongst those who should be mainly responsible for the introduction of any new law. The pamphlet has been circulated to every member of the House of Lords, the House of Commons, and over 4,000 members of County Councils, and includes, besides the speeches already referred to, a report of the County Council's deputation to the Local Government Board upon the speed question, an important letter signed by the General Council of the Automobile Club, which was distributed in March last to over 2,000 papers in the United Kingdom, and dealing with the importance of the industry upon the future of Great Britain, extracts from a memorial of manufacturers and sellers of motor vehicles to members of the County Councils of England and Wales, results of brake trials at Welbeck Abbey, &c.

THE VELOX 12-H.P. PETROL CAR—PART II.*

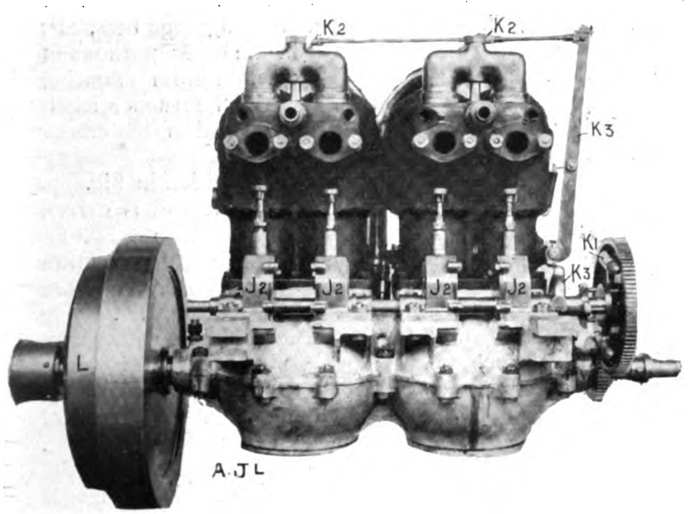


FIG. 12.—The Velox 12-h.p. Engine—Valve Side.

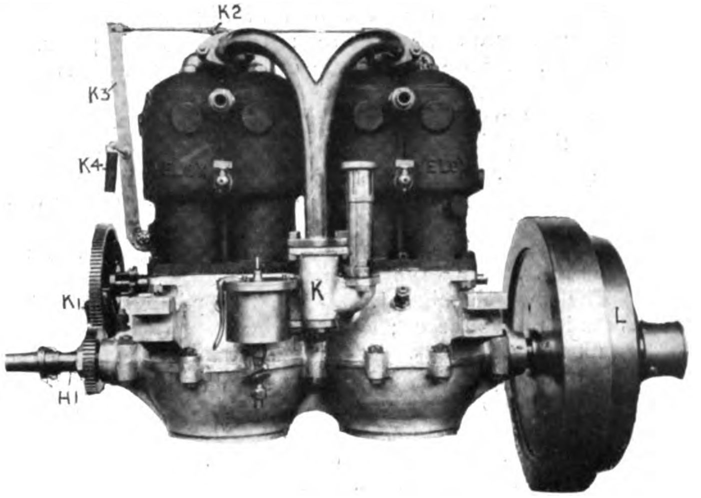


FIG. 13.—The Velox Engine—Carburettor Side.

THE engine is shown in Figs. 12, 13, 14 and 15. It is made by The Forman Engine Company of Coventry, and is subjected to a thorough series of tests by the Velox Company, before leaving the works in which it is built. Each pair of cylinders, together with their heads, valve chambers, and jackets, is a separate casting. The top of each jacket is formed by a dome which is held down in place by a single bolt. The valve-chambers are arranged in much the usual way, with atmospheric induction valves placed immediately above cam-operated exhaust valves. The induction valves for each pair of cylinders are fixed, removably, in place by a single nut which presses an induction-pipe-fitting down on both. The feed pipe leading to these fittings passes from a single carburettor, K on the opposite side of the engine, and its two branches are connected with the pipe fittings referred to through two throttle valves. The flange joints

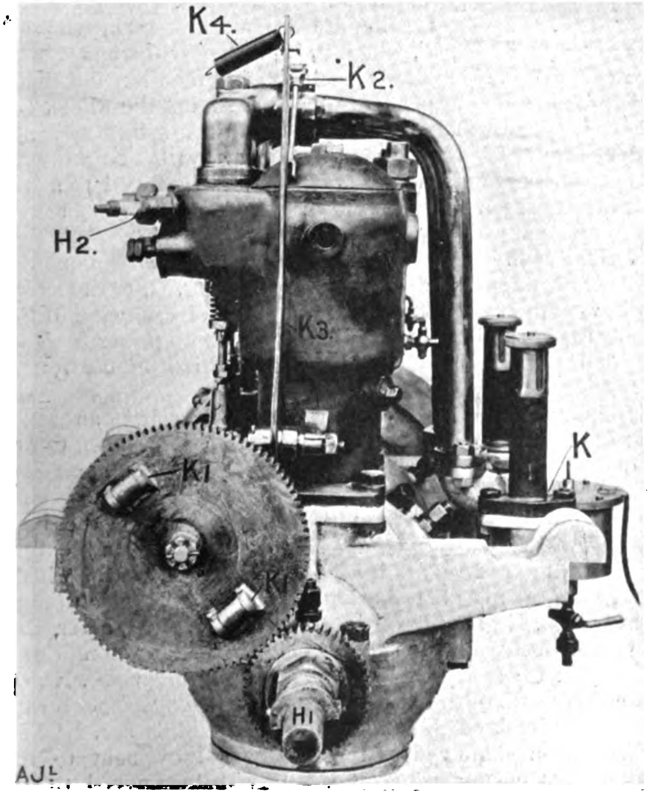


FIG. 14.—Front View of Velox Engine.

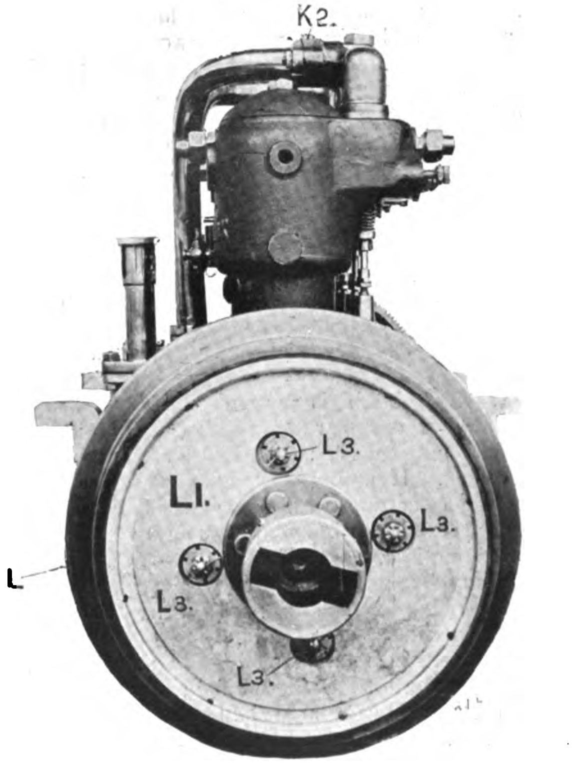


FIG. 15.—Rear view of Engine and Main Clutch.

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* On page 33, second column, line 8, read "V^6" for "V," and "V" for "V^1."

are made in such a manner that it is only necessary to slacken the nuts holding these parts together, when removing the valves. The engine shown in Fig. 14 is fitted with a double carburettor, and there are two induction pipes, but the single form seen on the other illustrations has been adopted as the standard model. The carburettor is of the float feed type, and the air is admitted through an upwardly projecting chimney having adjustable orifices at its upper end. The ignition plugs, H^2 (Fig. 14), of the ordinary high-tension pattern, are fitted into the side walls of the valve chamber between the inlet and exhaust valves. Provision is also made in the castings by which tube ignition can be fitted as an auxilliary if desired.

The crank-chamber, J, to which the cylinders are bolted, is made in two pieces; the joint between them divides the crank-shaft bearings. The crank-chamber beneath each pair of cylinders is of spherical shape, and two removable plates form doors of large size at the base of each of these parts. It is made of aluminium, and the upper portion is provided with two feet on each side, which rest on the brackets on the frame which have already been referred to. The cam-shaft lies outside the crank-chamber proper, but the cams and push-rods are enclosed in separate casings, J^2 (Fig. 12). The larger of the 2-to-1 gear wheels is fixed on the forward end of the cam-shaft, and contains a neat centrifugal governor, K^1, which regulates the speed of the engine. The pivoted lever, K^3, connects its sliding sleeve with the two throttle valves, K^2. The crank-shaft, H^1, is a solid steel forging, and is carried as usual by bearings at each end of the crank-chamber, and by a large central bearing. The accelerator is connected with the lever, K^3, through the spring, K^4, which when extended acts against the governor balls, thereby increasing the speed by preventing the governor from closing the throttle valves until the engine has attained a higher speed. The usual provisions are made for lubricating the various parts. As already stated, the cylinders have a bore of about 3⅝ inches, and the stroke is 4 inches. We are told that the engine has given over 16-h.p. at 900 revolutions per minute, and that the careful balancing of parts allows it to be accelerated up to 1,500 revolutions per minute without causing undue vibration. A circulating pump of the spur-wheel type, visible in Fig. 3, is bolted to one of the projecting feet of the crank-chamber. It carries a spur wheel on its spindle which meshes with the same wheel on the crank-shaft that drives the cam-shaft. The pump runs at a comparatively low speed.

The main clutch is formed inside the flywheel, L. The details of its construction are seen sectionally in Fig. 16. The male portion, L^1, is made of aluminium and has a leather face. It is bolted to a grooved sleeve, L^7, with which the operating fork engages. The sleeve, L^7, also forms a part of a flexible coupling, through which the power of the engine is taken to the gear box, N. The two parts of the clutch are normally held in engagement by four helical springs, L^5, which surround the four pins, L^3, and press against the aluminium portion of the clutch. The pins, L^3, are fixed to a plate, L^4, and the thrust between it and that portion of the clutch which is rigid with the crank-shaft is taken by a large ball bearing, L^6. The thrust bearing, L^6, can be lubricated through the oil-way seen in the drawing, after removing a screwed plug, L^8, in the periphery of the flywheel. By the construction adopted, all thrust on any of the moving parts is obviated whilst the clutch is in engagement, and, when disengaged, is taken by the bearing, L^6. The connection between the clutch and the gear box is also clearly shown in Fig. 16. The short shaft, M, terminates at each end in coupling members, M^1, which rest in corresponding spaces in the outer portions of the coupling. The shaft, M, is prevented from vibrating longitudinally by an internal spring, which presses a small sliding cap, M^2, up against the rounded end of the crank-shaft, H^1.

The gear-box, with its cover removed, is seen in Fig. 17, where O is the shaft which projects from it and is driven through the flexible coupling-shaft, M. The shaft, O, passes through the gear-box and has a squared section inside the box. It terminates in a bearing inside the shaft, W, these two shafts being in line with one another. The squared portion of the shaft, O, carries a sleeve, with which the three gear wheels, O^1, O^2, and Q^3, are rigid, and this sleeve is free to slide longitudinally upon it. The movements of the sleeve are controlled by a sliding rack, N^4, the rod of which is fixed to a forked arm engaging with the sleeve. The sliding rod is operated from the hand lever at the side of the car through a toothed quadrant which engages with the pinion, N^2, on the projecting end of a short shaft which is seen lying across the gear-box. The connection between this shaft and the sliding rod is through a wheel having a certain number of teeth upon it; the teeth engage in the rack, N^4. The gear-box was photographed by us when the gears were in a neutral position in which neither of the forward speeds nor the reverse would be in use, the first speed having been passed through, and the second speed not having yet been reached. For the first speed the wheel, O^1, would be brought into engagement with the wheel, P^1, on the lay shaft, P, the power being thus transmitted through this shaft to the wheel, P^4, which is at all times in engagement with the corresponding wheel, W^1, mounted on the shaft, W. The second speed results from sliding the wheel, O^2, into mesh with the wheel, P^2, and the third speed is available when the wheels, O^3 and P^3, engage with one another. When the sliding sleeve on the shaft, O, is moved to a still further position rearwards, the wheel, O^2, is brought into engagement with an internally toothed wheel, W^2, which is rigid with the wheel, W^1. Under these conditions the power is transmitted direct from the shaft, O, to the shaft, W, and although the lay shaft, P, still revolves, owing to the wheels, W^1 and P^4, being in mesh, yet no power is transmitted through it. A direct-through-drive on the fourth speed is thus obtained.

The "reverse" gear results from causing an independently mounted and intermediate gear wheel, O^4, to come into mesh with the two wheels, O^1 and P^1, and this result is brought about by a wheel, N^5, on the short cross-shaft, similar to the wheel, N^3, on its other end inside the box. When the sliding sleeve has been moved to its full extent forward, the plain portion of the periphery of the wheel, M^3, rests upon a plain portion of the rod, N^4, and although the wheel, N^2, is still further revolved by the driver, this has no effect upon the sliding rod. Under these conditions, however, the teeth on the periphery of the wheel, N^5, on the other side of the gear-box, come into engagement with a toothed rack on the under side of a sliding bar, N^6, and this bar in sliding gives the necessary movement to the intermediate spur wheel, O^4. It will be noticed that a small spring, N^7, is fixed to the gear-box and that it engages ~~in a groove~~ in the bar, N^6, in order to prevent the gear from being moved unintentionally by any vibration when the reverse gear is not being used. Should any back-lash occur in the control gear the spring catch also renders it immaterial. The gear wheels are of large size and the teeth are well rounded off at their edges. The box is very well made and the materials throughout appear to be of a high grade. The box itself is made of aluminium and has a large removable lid for facilitating inspection. It will be observed that four feet are cast with one portion of it; they rest upon the clips on the tubes, C, to which we referred last week. All four speeds ahead and the "reverse" are, of course, operated by the one lever.

The shaft, W, from which the power is taken to the live-axle, carries a combined brake drum and spring cushion device which is illustrated in Fig. 18. The portion, Q, which forms the brake drum is keyed to the shaft, W, and it contains another casting, Q^1, which is rigid with the outer portion of a flexible coupling. The two parts, Q and Q^1, are held together by bolts, Q^2, but they are capable of a small amount of relative rotary movement because the bolts, Q^2, are rigid at one end with the one part, and they ride in slots, Q^3, in the other part. This relative movement is, to a great extent, prevented from taking place by the action of internal helical springs, Q^4. When, however, the vehicle is being started from rest, or when the load upon the engine is suddenly varied, the springs, Q^4, allow the driving and the driven parts, Q and Q^1, to move a certain limited distance relatively to one another before the pins, Q^2, are forced to the ends of the slots, Q^3, — making the two parts rigid.

The brake band employed is of a somewhat novel design, and is so constructed as to allow for the taking up of whatever wear may occur whilst yet ensuring that the two parts of the metal band, R, do not normally rub against the drum, Q. Referring to Figs. 18 and 19, it will be noticed that the fulcrum pin, R^3, about which the two halves of the band, R, are pivoted, is carried in a casting, R^4, which is pivoted at its one end to one of the cross tubes of the main frame, A, and passes round beneath the band, terminating in an adjustable stop pin, R^5. The point of the pin, R^5, rests against the underside of the lower half band, R, and thereby allows a spiral spring, R^8 (Fig. 18), to serve the double duty of separating the two parts of the band and of holding it clear from the drum. The operating foot pedal, R^2 (Fig. 5), is connected through the rod, R^1, and a bell-crank lever, seen in Fig. 3, in such a way that when depressed it pulls the rod, R^7 (Fig. 18), from right to left, and therefore causes the link, R^6, to tighten the band, and to give a double-acting braking effect through the adjustable connecting pin, R^9, between the two parts of the brake band. It will be noticed that this ingeniously-designed brake gives metal-to-metal friction faces, and that it is of very substantial construction.

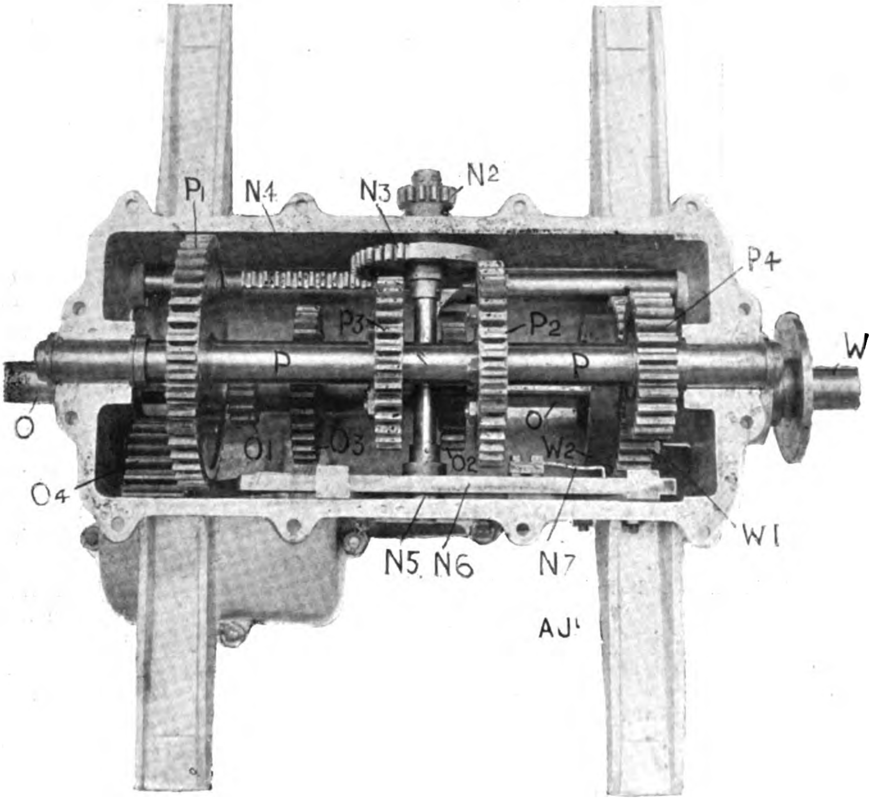


FIG. 17.—The Velox Change-Speed Gear.

The longitudinal propeller-shaft, S, transmitting the power from the spring cushion-device to the bevel-gearing about the live-rear-axle is also seen in Fig. 18, where it will be observed that flexible-coupling members, S^1, are provided at each end of it. The external portion of the one is rigid with the casting, Q^1, and the other is fixed to a shaft, F^5, upon the other end of which the smaller bevel-wheel, driving the differential gear, is mounted. The propeller shaft, S, is so arranged that it can accommodate itself to any such relative movements between the rear axle and the frame as are likely to occur, and although it is free to move a certain distance in the direction of its length, yet it is normally pressed rearwardly by a small spring-controlled plunger, S^2, the rounded head of which is in contact with a similarly rounded portion of its forward end.

The live axle (Fig. 7) is provided with an automatic lubrication system. The oil thrown up by the large bevel-wheel is conducted by pipes (seen above the casing) to the bearings on each side of the differential. After passing through the sleeves, F^1. it is led back to the gear-case through the tubular stays, F^3.

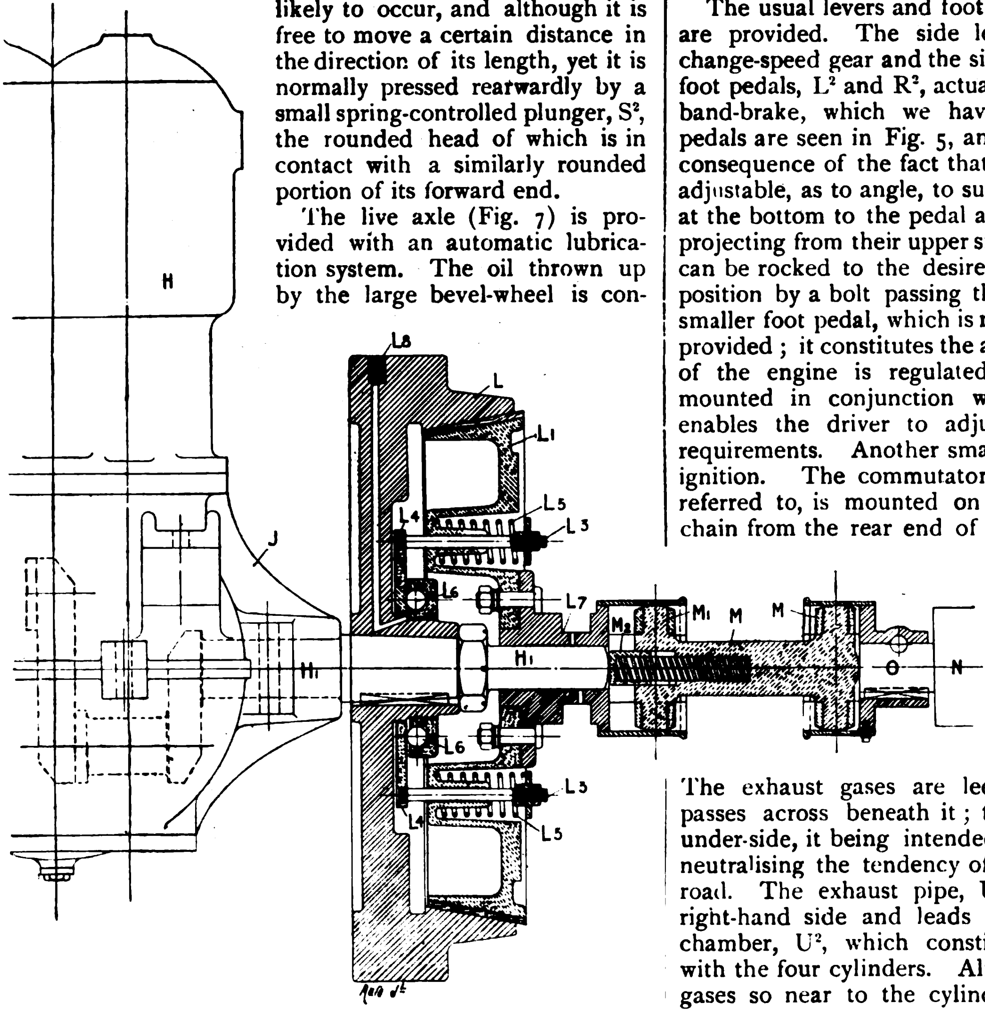


FIG. 16.—Section through Main Clutch and Flexible Coupling.

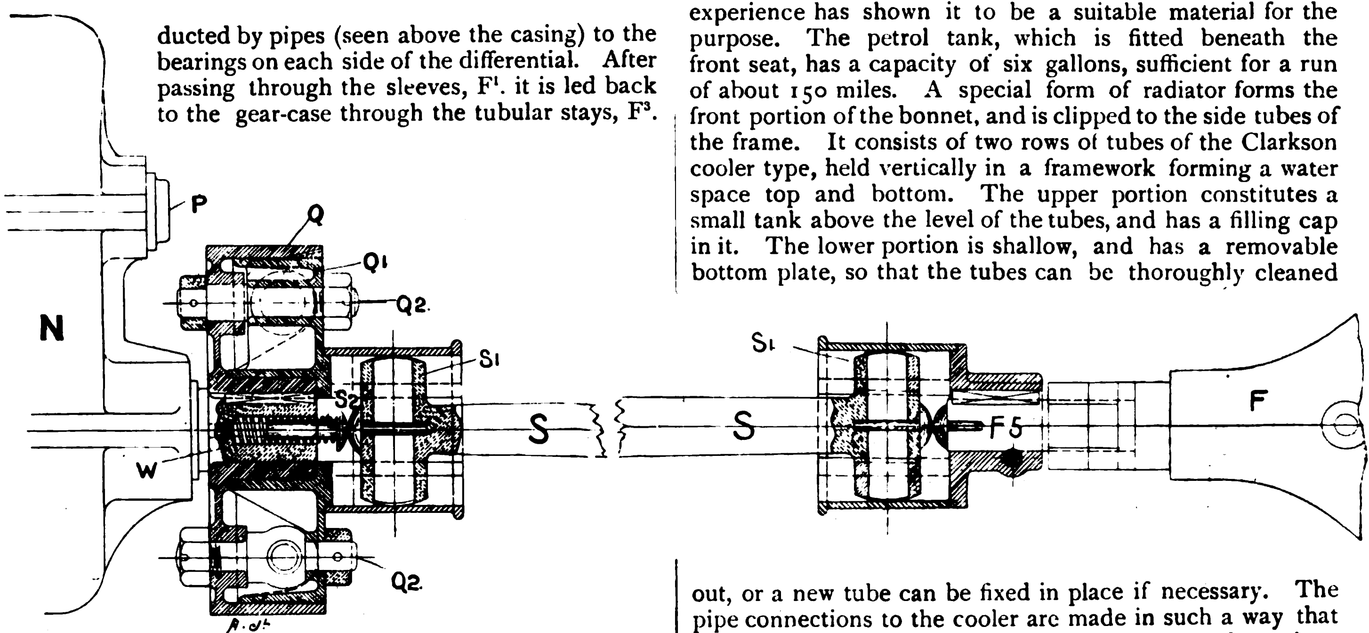


FIG. 18.—Section through Spring-Drive Brake-Drum and Propeller Shaft.

The usual levers and foot pedals for controlling the cars are provided. The side levers, N^1 and T^2, operate the change-speed gear and the side brakes, respectively, and the foot pedals, L^2 and R^2, actuate the friction clutch and the band-brake, which we have just described. The foot pedals are seen in Fig. 5, and deserve passing mention, in consequence of the fact that the foot plates upon them are adjustable, as to angle, to suit the driver. They are pivoted at the bottom to the pedal arm, and have slotted quadrants projecting from their upper sides in such a manner that they can be rocked to the desired angle before being fixed in position by a bolt passing through the slot. A third and smaller foot pedal, which is not shown in our illustrations, is provided; it constitutes the accelerator. The normal speed of the engine is regulated by a hand sector, which is mounted in conjunction with the accelerator pedal; it enables the driver to adjust the normal speed to suit requirements. Another smaller lever regulates the time of ignition. The commutator, which we have not hitherto referred to, is mounted on the dash, and is driven by a chain from the rear end of the cam-shaft. The induction coil and a lubricator are fixed to the dashboard.

The exhaust box, U (Fig. 3), is fixed below the rear tube of the frame, and is made of aluminium. It consists of two expansion chambers with a perforated plate between them. The exhaust gases are led from it into a pipe which passes across beneath it; the pipe is perforated on its under-side, it being intended to create a down-draught for neutralising the tendency of dust to fly upwards from the road. The exhaust pipe, U^1 (Figs. 2 and 3), lies on the right-hand side and leads from an aluminium expansion chamber, U^2, which constitutes the exhaust connection with the four cylinders. Although the heat of the exhaust gases so near to the cylinder might be supposed to preclude the use of aluminium for this fitting, we are told that experience has shown it to be a suitable material for the purpose. The petrol tank, which is fitted beneath the front seat, has a capacity of six gallons, sufficient for a run of about 150 miles. A special form of radiator forms the front portion of the bonnet, and is clipped to the side tubes of the frame. It consists of two rows of tubes of the Clarkson cooler type, held vertically in a framework forming a water space top and bottom. The upper portion constitutes a small tank above the level of the tubes, and has a filling cap in it. The lower portion is shallow, and has a removable bottom plate, so that the tubes can be thoroughly cleaned out, or a new tube can be fixed in place if necessary. The pipe connections to the cooler are made in such a way that it can be disconnected and taken off in a very short time. The air is drawn through the tubes by a fan placed behind them, and driven off the front end of the crank shaft. An additional water supply is carried in a tank, the shape of which is seen in Fig. 20. It is fixed beneath the level of the frame, and a hole is provided through it to allow the starting handle to pass to the crank-shaft. The tank is made of copper, and is ribbed and stayed. In the design, both of the radiator and the tank, appearance has been largely studied, the former making a suitable finish to the bonnet, which fits over it, and the latter making a front apron beneath. The bonnet is square, with bevelled-off corners, and is fixed in such a manner that it can be quickly removed. Owing to the close proximity of the circulating pump, the water jackets, the radiator, and the water tank, the piping required for connecting these parts together is in convenient short lengths.

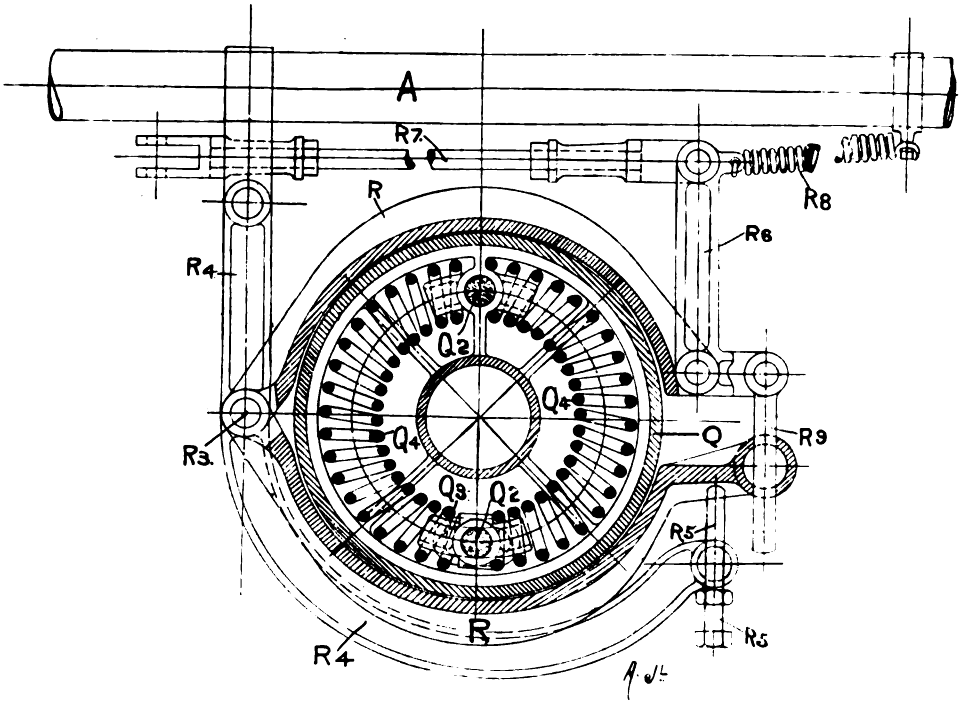


FIG. 18A.—Velox Spring-Drive Brake-Drum with Brake-Band.

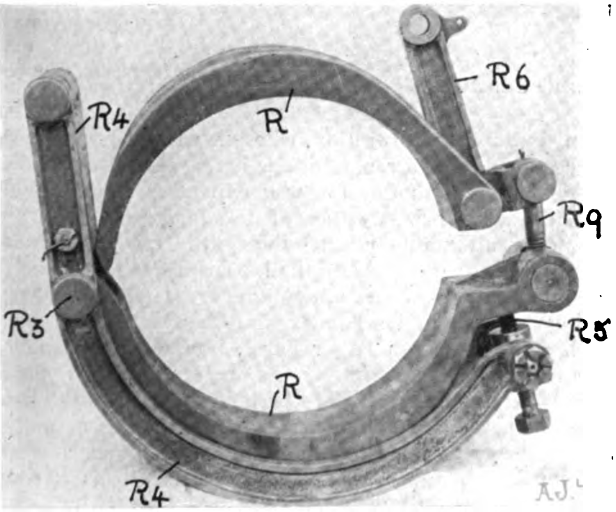


FIG. 19.—The Velox Brake-Band.

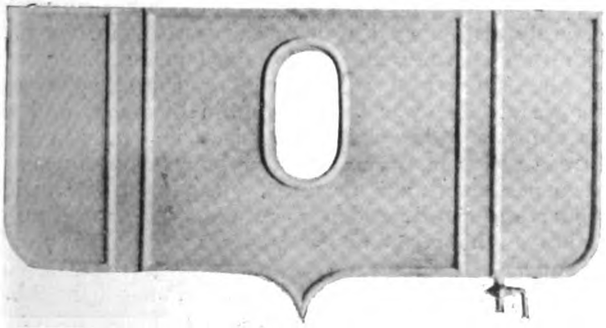


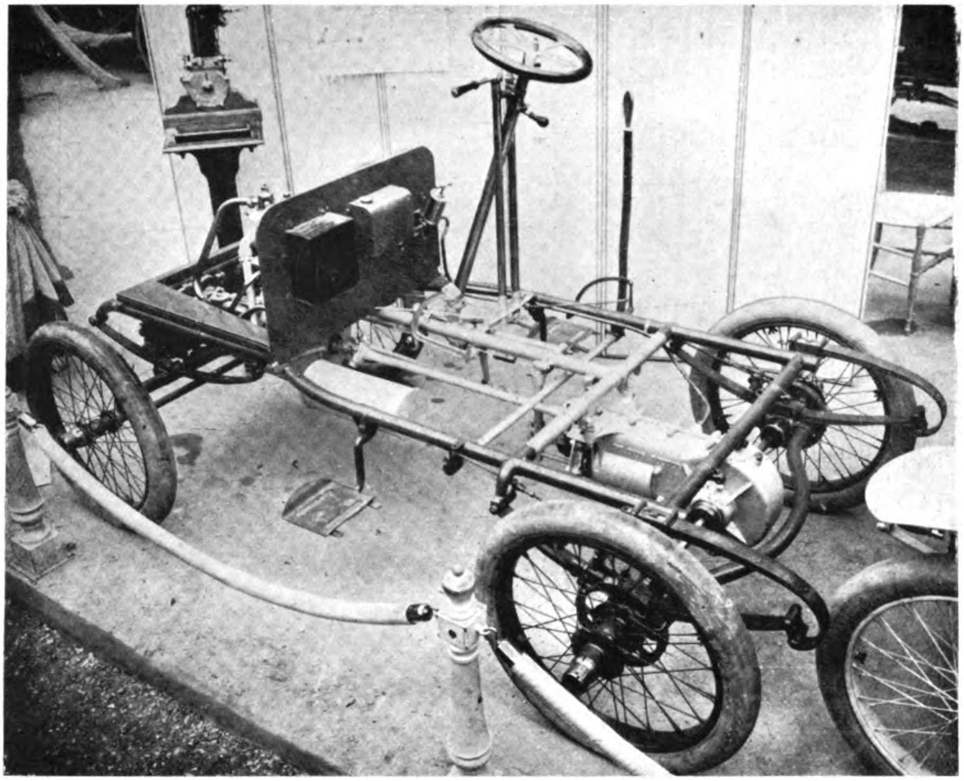
FIG. 20.—Water Tank on 12-h.p. Velox Car.

At the time of our recent visit to the works, several of these interesting vehicles were nearing completion, and the various parts for others were being pushed through the shop. It will have been gathered from this article that the new 12-h.p. Velox car is the result of some little practical experience and careful design, and that the materials of which the different parts are made have been selected with a view to strength, lightness, and low cost. The Company provide all necessary spare parts and accessories, both for the engine and for other portions of the machinery, with each car, and have placed the complete vehicle on the market at £600. The bodies are made by Messrs. Mulliner, of Northampton, and a standard pattern has been adopted for these cars. The Company, however, are prepared to fit special bodies to suit any special requirements which their customers may have.

TOURIST MOTOR BICYCLE RELIABILITY TRIAL.

AT the meeting of motor cycle manufacturers and agents, held on the 13th instant at the Automobile Club, it was decided to hold a reliability trial of tourist motor bicycles early in August, the distance to be at least 1,000 miles, each day's run to be not less than 100 miles, and the trial to be concluded within a fortnight. Non-stop runs are not to be recorded, as it was suggested by one speaker that it was a trial of motor bicycles and not of consciences. Freak machines are not to be admitted, the maximum power of motors to be allowed being about 3-h.p.—the formula for determining the power by bore and stroke to be settled by Professor Boys and Mr. O'Gorman. No maker shall enter more than three machines of different powers, and no duplicates to be allowed. An organising committee of twenty is to be appointed, consisting of ten representative manufacturers and ten nominees of the Automobile Club. Mr. Straight was appointed secretary to look after these trials.

THE ANNUAL A.C.F. SHOW IN PARIS.—Part V.

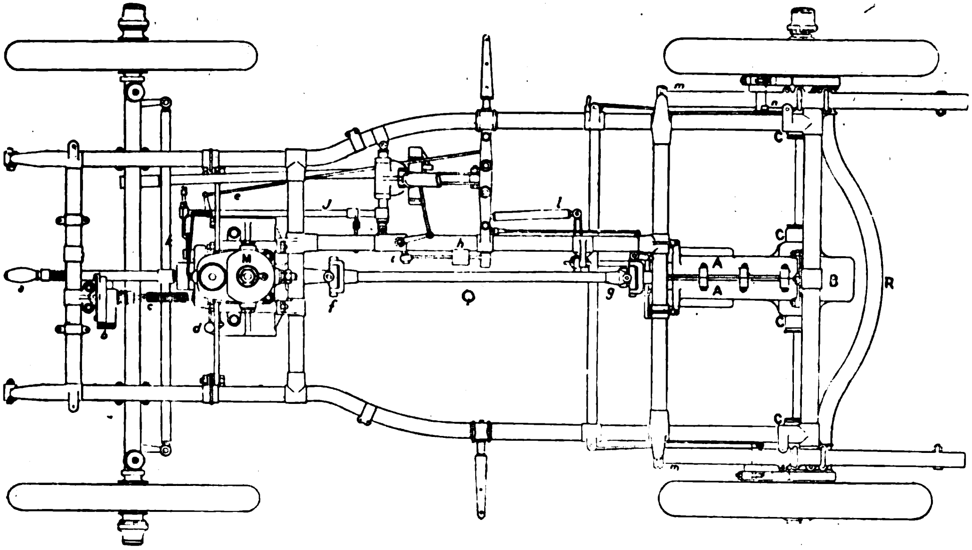


The De Dion "Populaire" Voiturette Chassis.

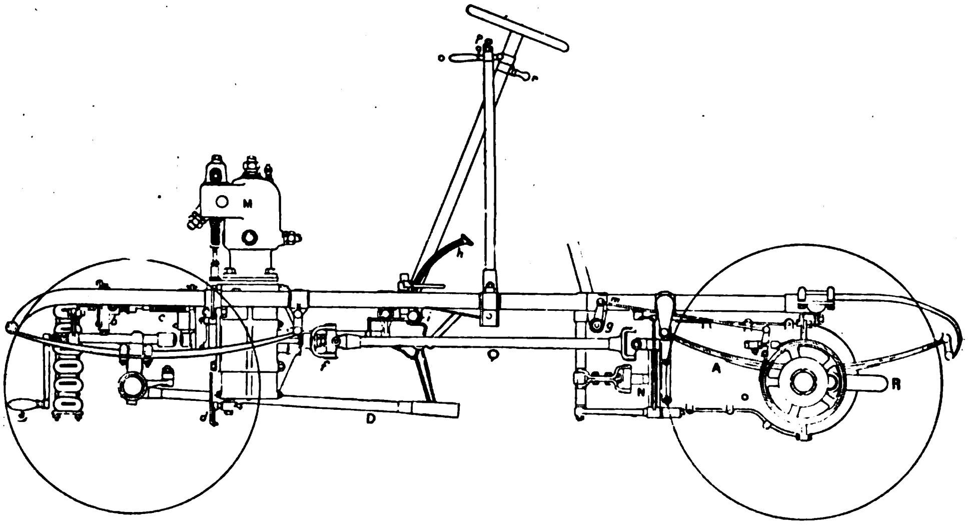
De Dion-Bouton and Co. made a very good exhibit with their well-known vehicles and engines. Their new "Populaire" voiture, which we illustrated in October last (page 676), was possibly the chief attraction, but their latest 2-cylinder 10-h.p. model created no small interest also.

The "Populaire" voiturette is fitted with a single cylinder 6-h.p. engine, which is fixed in front to two inner longitudinal members of the tubular frame. Our illustrations reproduce a photograph, as also a plan and side elevation of the chassis. The engine itself does not call for any special mention as it is in general respects similar to their previous well-known models. It has no external flywheel or clutch, the crank-shaft being connected through a universally-jointed longitudinal shaft with the first-motion-shaft of the change-speed gear. The crank chamber is lubricated from the dashboard by a small hand pump, and a two-way cock is fitted so that the same pump can be used alternatively for forcing oil to the gear-box. The engine is water cooled, and the circulating pump, which forces the water through a radiator in front, is driven through a helical spring from the engine; the pump itself is fixed to the front member of the tubular frame, and the helical spring couples its spindle with the driving shaft on the engine; the two shafts being in line with one another, a thoroughly flexible drive is thus secured. The change-speed-gear is enclosed in a neat casing which is rigidly fixed to the two rearmost cross-members of the frame. The casing is divided vertically down the centre, and a third portion covers the large bevel wheel and the differential gear at the back. The gearing is shown in another illustration, where it will be seen that the first-motion-shaft is arranged immediately above the second-motion-shaft, and that a two-way expanding clutch, of the De Dion type, brings either of the forward speeds into operation, alternatively at the will of the driver. Both shafts are mounted in ball bearings. The clutches are operated from a horizontal lever alongside the steering pillar. The second-motion-shaft carries a bevel wheel, which drives a larger bevel, bolted to the shell of the differential gear. Spur-wheels are employed as planets in the differential. The gear-box being rigid with the main frame, the makers' well-known Cardan axles are employed to transmit the power from the differential to each of the rear wheels. The bearings in which the wheels run are connected together by a stationary axle formed by a bent tube. The main frame is carried on semi-elliptic springs in front, and on similar springs at the rear, the back ends of the latter, however, are connected with the tubular frame by rearwardly projecting leaf springs, as seen in our illustrations. The voiturette is very well made throughout, and, when fitted with a "reverse" and artillery wheels, costs £210. The wheels are 27 in. in diameter, and the tyres are 3 in. wide. The wheel base is 5 ft. 7 in., and the tread 3 ft. 10 in. The standard body has a single seat for two passengers, and measures 3 ft. 3 in. on the inside. A spider seat can be added if desired. Any speed up to 27 miles an hour can be attained. The weight is 7 cwt., with body.

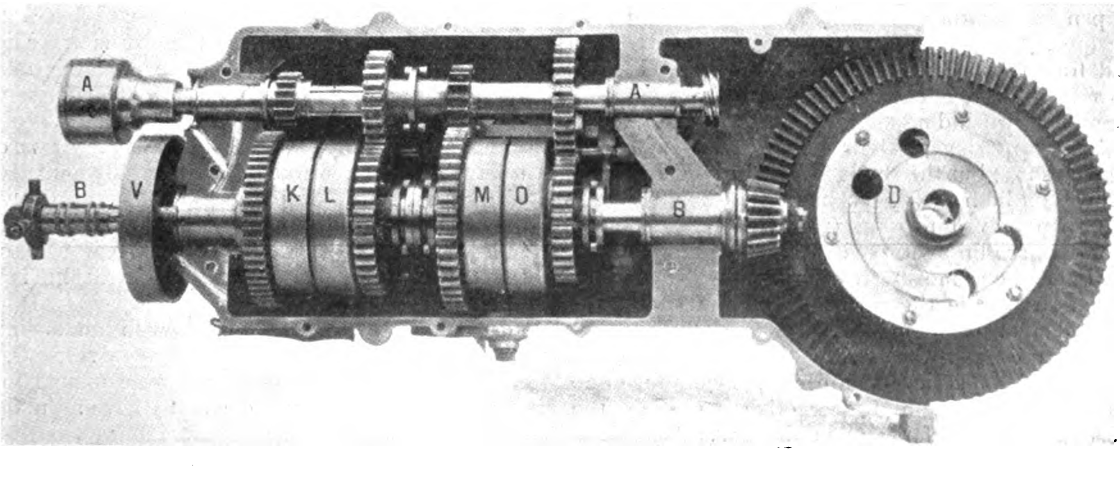
The 10-h.p. car is in general respects similar to the 8-h.p. model of last year, except that a 2-cylinder motor is



Plan of De Dion "Populaire" Voiturette.



Side Elevation De Dion "Populaire" Voiturette.



De Dion Gear Box—three speeds and "reverse"—for 10-h.p. car.

employed and that the gear-box is greatly modified. The same method of suspension has been adopted, for particulars of which we would refer our readers to our description of the vehicle which took part in the Reliability Trials last year (page 577 Vol. VII.). It will be seen from our drawing of the engine that the two cylinders are cast together in one piece with their jackets, and that the atmospheric inlet-valves are held in place above the exhaust-valves by a yoke, Y, and a single nut. The induction pipe fittings for each valve are separate, and are of the same shape as those hitherto employed on the single cylinder motors. The general construction of the engine is clearly shown; a novel feature is that an oil pump, P, is provided for circulating the oil feed to the crank chamber. The oil supply is contained in a tank, T, fixed to the cylinder casting, and it finds its way to the various parts on the splash principle. The pump is driven through a vertical shaft, S, by spiral gearing from the cam-shaft, and it continues to take the oil from the bottom of the crank-chamber, and to force it back again into the tank, T. Sufficient oil for running 350 miles is carried. The cam-shaft is mounted in bearings of the ring-lubrication pattern.

The commutator on this motor differs considerably from those used on previous types; it is shown in one of our illustrations. The plate upon which the various parts are mounted is made of metal, and the contact pillars, E and E^1, are insulated from it, as also are the terminals, F and F^1, to which they are connected, respectively. It is so mounted about the cam-shaft that it can be removed without taking the cams off the shaft. This is provided for by spring plungers, G, which can be drawn outwards against the action of enclosed springs. Two cams, C and C^1, placed alongside one another, are fixed to the shaft, and are so shaped that the projections on them are at the required angle of 90°. The cams act upon hardened steel pins which are fixed to the ends of a forked piece pivoted at D, to which a contact-making spring is attached. The one cam, C, causes the contact spring to make circuit with the fixed contact, E, and the other cam is scooped out to allow the pin, which it operates, to move inwards for this purpose. Both cams are similarly shaped, and it will be noticed that an extremely quick "break" as well as a quick "make" results from the design. A light cover is provided which fits over the moving parts, and is secured in place by fly nuts on the pillars, B.

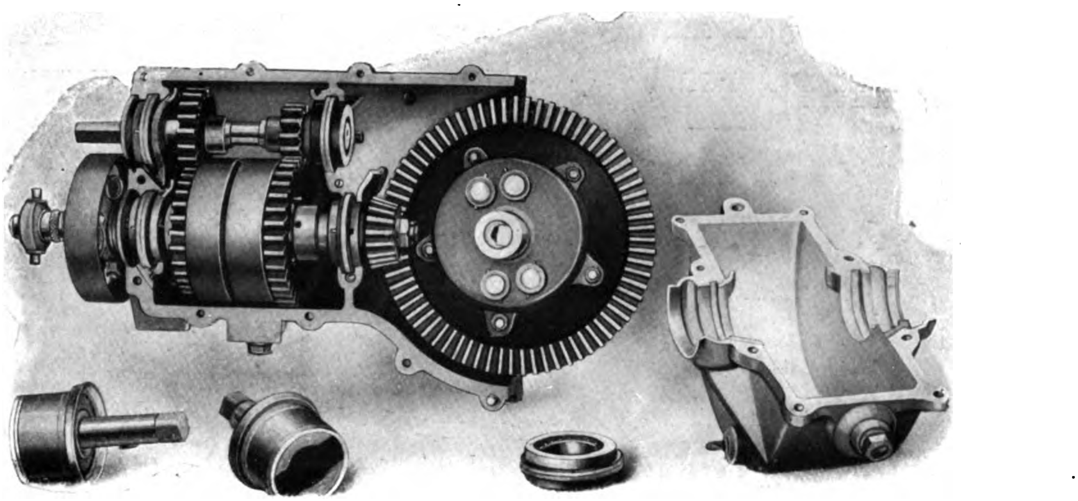
The change-speed gear on this larger car is shown in the accompanying illustration. The first-motion-shaft, A, lies above the second-motion-shaft, B, and the power is transmitted from the latter to the differential, D, by bevel wheels, as seen. Three speeds and a reverse are available, although only two expanding clutches are mounted on the shaft, B. The expanding portions of the clutches do not slide along the shaft, but the shells K, L, M and O, with all the spur-wheels on both shafts, can be moved longitudinally together. When moved forward (to the left) the clutch shells, L and O, are brought outside the expanding clutch members, but when moved rearwardly the expanding members will be inside the shells, K and M. It will be understood that each of the clutch shells is rigid, with one of the spur-wheels on the second-motion-shaft. Two controlling levers are employed, the one to operate the clutches, and the other to slide the gear wheels backwards or forwards in the box. When the shell, K, is made rigid with the second-motion-shaft, the "reverse" gear is brought into play, an intermediate pinion connecting the spur wheels on the two shafts. By holding the shells, M, L, and D, the first, second, and third speeds, respectively, are brought into use. A band brake, V, is fixed outside the gear-box on the forward end of the second-motion-shaft. The power is transmitted from the engine to the first-motion-shaft by a longitudinal shaft with flexible couplings, and, as in the case of the other vehicles, the power is taken to the rear wheels by Cardan axles. The entire gear-box is automatically lubricated by a circulating pump in much the same way as the crank-chamber of the engine. The pump is driven by the worm wheel seen on the rear end of the first-motion-shaft.

The contact breaker on the Company's bicycle motor (*see* pages 240 and 241, Vol. VII.), of which they showed samples, is of an entirely different design from that used by them on their other motors. This device is shown in one of our illustrations. The trembler has been done away with as in the new 10-h p. engine, and the cam makes contact between two springs instead, a single make-and-break only being effected at each revolution of the cam.

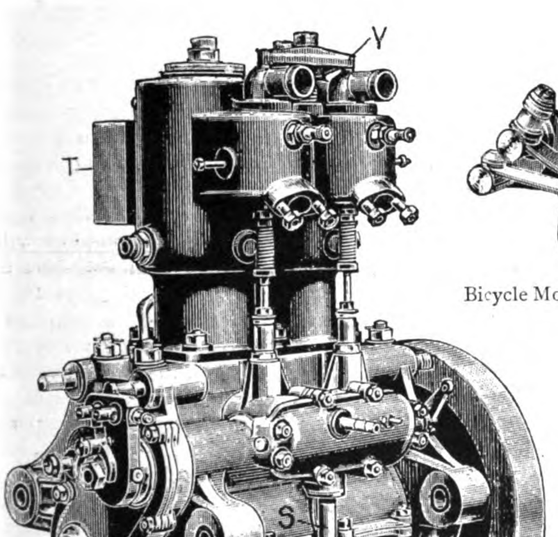
Amongst other vehicles exhibited by them was a two-ton heavy van, the chassis of which was equipped in a similar manner to their 8-h.p. pleasure vehicle, with a single cylinder motor, and with a 3-speed gear-box. In this model, however, the Cardan shafts pass from the differential gear to pinions, which work in internal gear wheels fixed to the rear wheels, instead of passing to the rear wheels direct. The necessary reduction of gear ratio, and increase in strength of the chassis is thus provided for.

The Boyer models for this year were demonstrated by one 2-cylinder chassis and one 4-cylinder chassis, the former being represented in our illustration. The main frame is constructed of wood, with steel plates. The engine is fixed by projecting feet direct to it, and the motor has mechanically-operated inlet-valves, which are placed in the same valve chamber as the exhaust valves; they are operated by cams upon the same cam-shaft. A centrifugal governor is arranged on the front end of the cam-shaft, and is connected with a throttle-valve. Separate exhaust-pipes are led from each cylinder. The ignition system is of the ordinary high-tension type; the igniters are screwed into the inspection plugs above the inlet valves. The change-speed gear provides three forward speeds and a reverse, which are worked by a single side lever. A direct-through-drive is obtained on the top speed, and the lay-shaft, by which the other speeds are obtained, is mounted above the "through" shaft. The lay-shaft remains stationary when the car is travelling on the top gear. The gear-box is fixed to the main frame by feet at its forward end, and is attached to a cross member of the frame at its rear end. The main clutch is of the cone pattern, and works inside the flywheel. It is connected with the gear-box through a universally-jointed coupling, and the two ends of the countershaft also have flexible joints in them. The power is transmitted from the countershaft by side chains to each of the rear wheels, and the usual brakes are fitted. The 2-cylinder engine is nominally of 10-h.p.

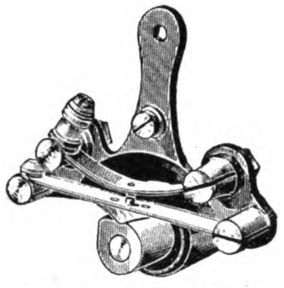
The 4-cylinder model is fitted with an engine of either 16 or 24-h.p. The chassis is, in general respects, similar to the one above described, but we were unable to ascertain whether the standard vehicle is to have an underframe or not. The change-speed gear gives four forward speeds and a reverse, instead of only three, and a radiator of the honeycomb type—but without any fan—is fitted in front. The



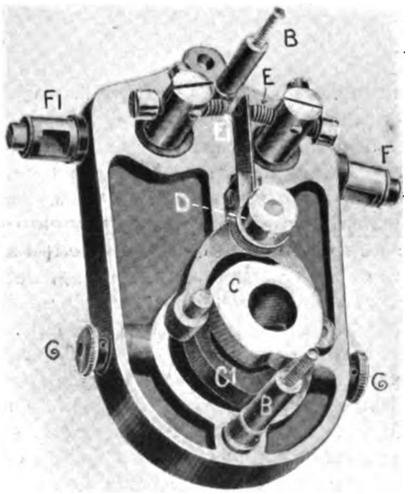
De Dion Gear-Box—" Populaire" Voiturette.



Two-Cylinder De Dion Motor.



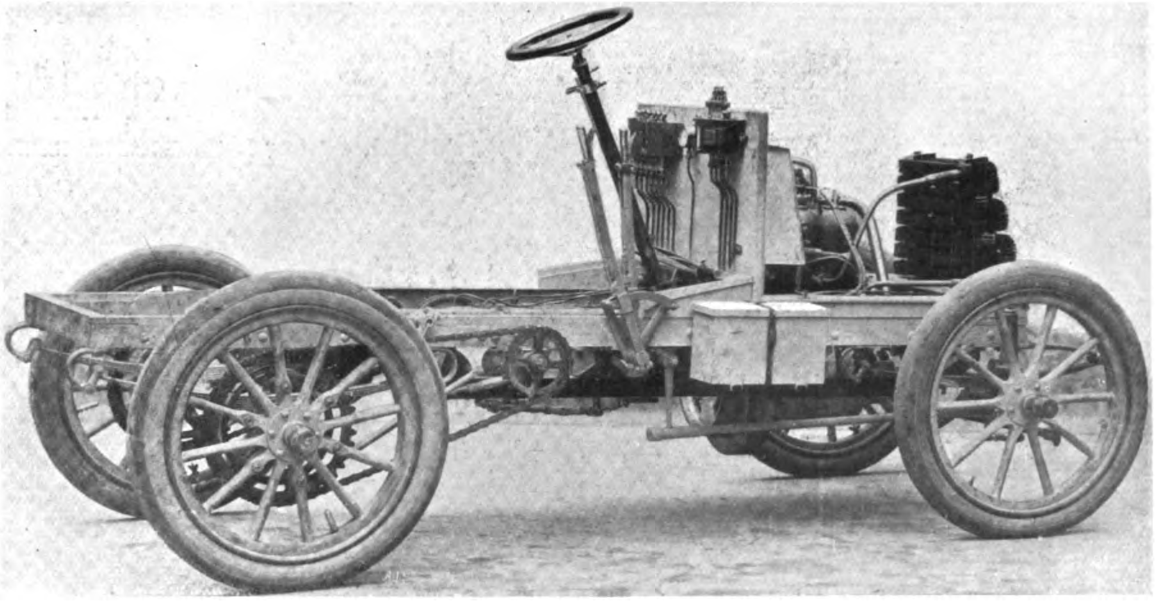
Bicycle Motor Contact Breaker.



Contact-Breaker on 10-h.p. De Dion Twin-Cylinder Engine.

commutator is driven through an upright shaft by bevel gearing off the rear end of the cam-shaft; it is conveniently placed for inspection at any time. The spur wheels driving the cam-shaft have helical teeth.

Two new Renault models were shown, and a chassis of each was exhibited. One was fitted with a 4-cylinder motor of 14-h.p., and the other with a 10-h.p. engine having twin cylinders. The main frames are of tubular construction, and are provided with underframes of similar form for carrying the engine and the gear-box. The makers have still retained several of the distinctive features which are associated with their earlier types, chief amongst which may be mentioned the arrangement of the change-speed gear (*see* Vol. VII., pages 363 and 364), and the employment of radiators forming the sides of the bonnet, and connected with the jackets in such a way as to create a natural circulation of the cooling water. A water tank, fixed to the front of the dash, is also provided. The 4-cylinder engine was provided with mechanically-operated inlet valves placed on the same side of the cylinders as the exhaust valves. The high-tension ignition plugs are mounted between the valve chambers and the cylinders, and the electrical connections are made with them by knife switches. Steel tie rods are fitted from the brackets which carry the rear ends of the front springs down through the step brackets, and up from there to the main frame, above the rear axle. The main clutch is of the internal cone type, and the power is taken through a universally-jointed longitudinal shaft to the live rear axle. A forked distance rod, the ends of which are connected to the top and bottom of the casing surrounding the differential, is pivoted at its other end by a ball-socket joint to a tube projecting downwards from the centre of

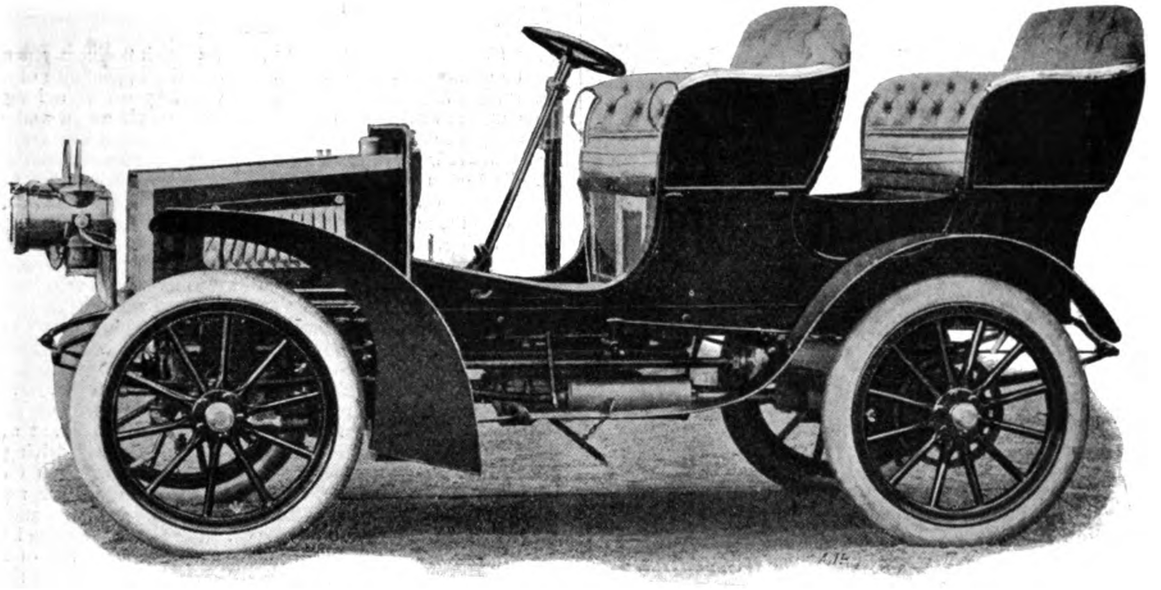


The Boyer Chassis—Twin-Cylinder Model.

main frame. The brake, which is operated by the foot pedal, is mounted inside the casing enclosing the bevel-drive to the rear axle. The side brakes are of the internal type, and are entirely closed in. The motor on the 2-cylinder chassis had atmospheric inlet valves, and was provided with means by which they could be held open.

The new Clement models consisted of a 2-cylinder 9-h.p. car, and of a 4-cylinder vehicle with either a 12 or 16-h p. engine. In both types the transmission is by longitudinal shaft and bevel gearing to a live rear axle. The 9-h.p. main frame is made of wood with flitch plates, and the engine and gear are carried upon an underframe, on a slightly lower level. The 12 or 16-h.p. vehicle is similar, except that the main frame is made of stamped steel. One of the most noticeable features on the Clement cars is the arrangement of the low-tension ignition on the engines. The ignition plugs are mounted vertically, and form inspection covers above the inlet valves. Their rocking arms are operated direct from cams carried on a cam-shaft which revolves in bearings across the tops of the cylinders. This cam-shaft is driven by bevel gearing, and is provided with a timing gear, which advances or retards the cams relativelv to the crank-shaft. The current is either supplied by a gear-driven magneto, or by a dynamo in frictional contact with the flywheel. The inlet valves are on the same side of the cylinders as the exhaust valves, and are operated by cams on a common cam-shaft. The engine is controlled by a centrifugal governor, which is enclosed in front of the crank chamber, and which operates a throttle-valve. The change-speed gear adopted gives a direct-through-drive on the top speed ; the gear-box on the 2-cylinder model gives three, and that on the 4-cylinder cars four, forward speeds. On both vehicles, the engines are provided with a single exhaust-pipe-fitting which passes across and connects the exhaust ports of all the cylinders, a practice upon which we have already expressed our adverse views. The Company also showed some of their single-cylinder voiturettes.

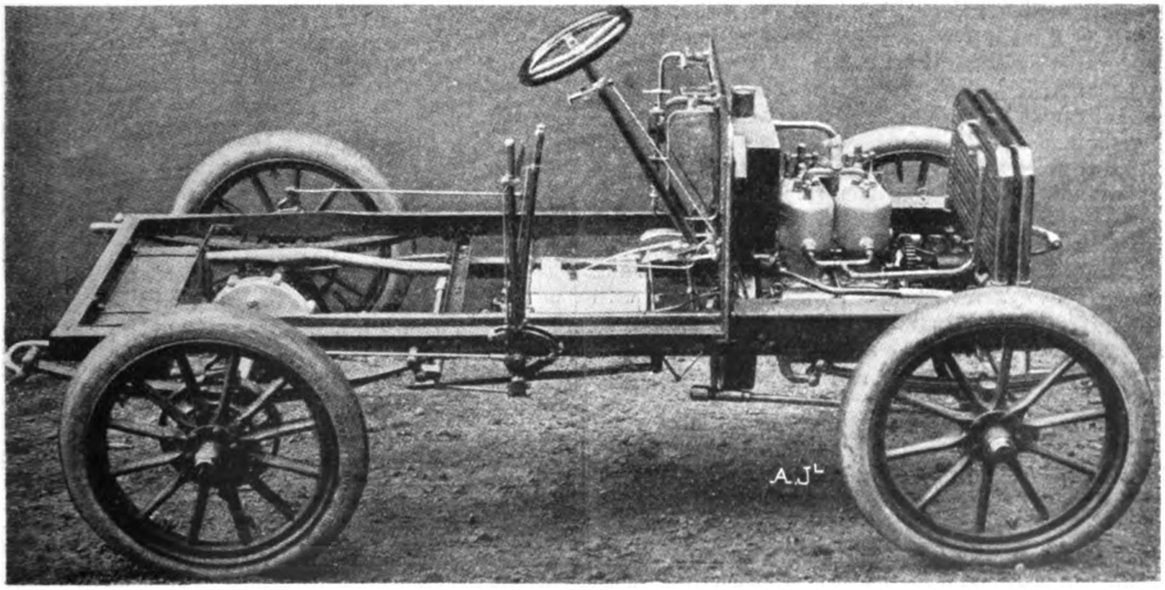
Benz and Co. showed a chassis of their new Benz-Parsifal 1903 type, in which they have departed from their earlier distinctive models. and have adopted the leading features which are found in the majority of modern cars. Our illustrations show one of these vehicles, as also the chassis and the twin-cylinder motor. The main frame is made of wood with steel flitch-plates, and the engine and gear-box are carried on a separate underframe. In general respects the arrangement of the driving mechanism is the same as in other cars in which the power is transmitted to a live rear axle by a universally jointed shaft, and enclosed bevel gearing about the differential gear. The engine is of the vertical type, and each cylinder with its jacket is a separate casting. It has atmospheric inlet valves, which are held in place by the pipe fittings leading the explosive mixture to them, and by a yoke piece and single nut. The cam-shaft is outside the crank-chamber, and carries cams for operating the exhaust valves and low-tension igniters; the latter fit into the side of the valve chamber, between the inlet and exhaust valves. Separate exhaust pipes are led from each cylinder. A centrifugal governor is constructed inside the larger spur-wheel, which is fixed, as usual, on the front end of the cam-shaft. A magneto machine supplies the current for the ignition ; it is fixed to the frame in front of the engine, and is driven by spur-wheels from the crank shaft. A circulating pump of the gear-wheel type is also fixed to the front of the frame. A fork projects forward from its spindle (*see* illustration), the prongs of which engage in slots in the governor spur-wheel ; it is therefore driven on the lathe carrier principle, and is flexibly connected with the cam-shaft. The gear-wheels in front of the crank chamber are enclosed in a separate casing. The radiator forms the front of the bonnet, and is composed of two frames built up with flat tubes having corrugated strips of metal between them. One frame lies in front of the other, and the air finds its way through them when the car is travelling ; there is no fan. The main clutch is formed in the flywheel, which is of large size The clutch is of the



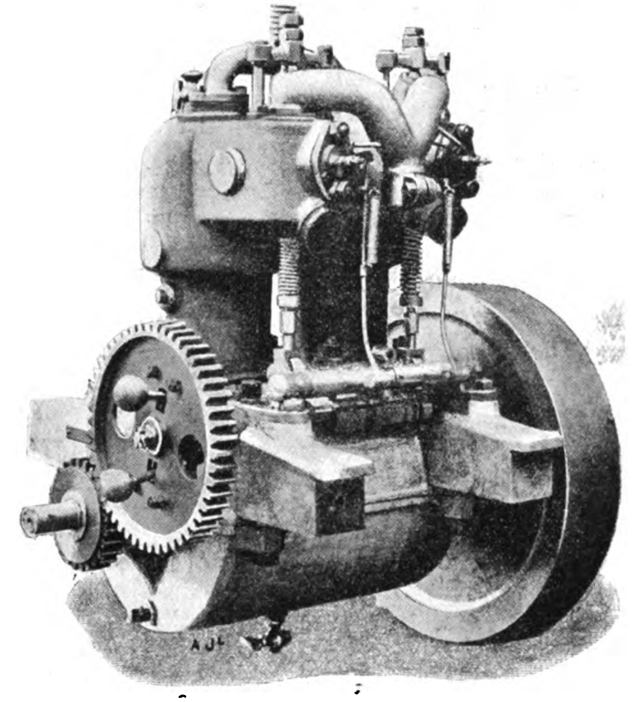
The Benz-Parsifal 1903 Car.

internal cone type, and the change-speed-gear is of the now well-known pattern in which a direct-through-drive is obtained on the top speed. The lay-shaft lies alongside the other shaft in the gear-box. The foot-brake is arranged immediately behind the gear-box, and is of the internal type. The chassis was not as well finished off as many others in the Show, and in fact gave one the impression of being somewhat roughly made. The working parts, however, so far as we could see, were well fitted. The car has three speeds and a reverse, all of which are worked by a single lever.

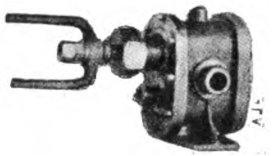
Our readers are already conversant with the special system adopted on the Bardon cars. (It was described by us in May last on page 70, Vol. VII.) The Company now have three types of vehicle, the one being fitted with a 2-cylinder motor of 12-h.p., and another having a single-cylinder 8-h.p. motor. These two models are practically the same as hitherto, the power being transmitted from a differential countershaft to the rear wheels by side chains. Their new 5-h.p. vehicle, however, differs a good deal in design. The single cylinder, with its two pistons, is placed longitudinally instead of transversely. The two crank-shafts are inter-connected through bevel gearing by a first-motion-shaft of the change-speed-gear, and the power is transmitted from a second-motion-shaft by a universally-jointed Cardan shaft to a live rear axle. A main clutch of the cone type engages, or renders free, the gear wheels on the first-motion-shaft, and the various speeds are brought into play in much the usual manner by sliding spur wheels on the one shaft into mesh with corresponding wheels on the other. This further development of the Bardon system is interesting, for it is one of the few modern cars which is



The Benz-Parsifal 1903 Chassis.



The 2-cylinder Benz-Parsifal Engine.



The Benz-Parsifal Pump.

fitted with a balanced motor having horizontal cylinders.

The chassis of a vehicle of somewhat unusual construction was shown under the name of the "Motobloc." The chief feature of the car is that the crank-chamber is made in one with the gear-box. The engine has two cylinders, which are cast in one piece, and which are bolted at an angle of about 45 degrees to the crank-chamber. The combined crank-chamber and gear-box lies beneath the driver's feet, and the cylinders project upwardly and forwardly beneath the dash. The main clutch is arranged outside the large casing on the one side, and the flywheel lies outside on the other side. Three speeds and a reverse are provided by sliding spur-wheels in and out of mesh with one another. The power is transmitted by a single chain just inside the main frame, on the right-hand side, to a live rear axle. The motor is of 10-h.p., and its normal speed is 1,000 revolutions per minute. The chief object of the design is to condense the driving mechanism into as compact a space as possible. A curious feature of the motor is that both the induction and the exhaust valves can be entirely removed, together with their seats. The Motobloc was one of the few exhibits in which any radical change of system was displayed.

(*To be continued.*)

Within a few days *L'Auto Vélo* will drop the second half of their title and be known in the future as *L'Auto* simply. Although the change in name has been brought about by the result of the legal action taken by the *Vélo*, we think the proprietors of *L'Auto* are to be congratulated upon the crispness of the shorter title. It is assuredly not likely to diminish the popularity of the publication as an up-to-date sporting newspaper.

SEVEN YEARS OF AUTOMOBILISM TOURING AND CONSTRUCTION.*

Baron Henri de Rothschild, after a few introductory remarks, said that he would endeavour to remove even the appearance of a technical dissertation from his paper, which was inspired by a long practical acquaintance with motor cars. He would speak as an amateur of the special sport, and, as a doctor of medicine, would ask for indulgence for a few words on automobilism and its consequences, considered from a medical point of view. He imagined he had been invited to speak by the Committee as a kind of reward for his having been one of the first to take up the new locomotion.

Continuing, the Baron said :—"It was in fact in 1895 that I, for the first time, put my foot on a vehicle provided with a petroleum motor. Nothing would have made me believe after this first attempt, that I should ever become the fervent automobilist I am to-day. Indeed, here is, in a few words, the summarised account of my first "campaign." In May, 1896, one of my friends had invited me to go with him from Paris to Chantilly. There were about 25 miles to go over, and at that time these 25 miles were quite a journey, and for getting over them we relied on a small 6-h.p. Peugeot car (one of the first supplied to amateurs) in three or four hours' time, that is to say, at an average speed of six to eight miles an hour. My friend was driving the car. We had already gone about six miles out of Paris, when I asked my guide if it were a difficult thing to drive a motor car. He replied that nothing was easier. He persuaded me to take his place and indicated the pedals and levers for changing speed or for working the brake. The steering bar was somewhat similar to the steering bar of a bicycle. Travelling in a straight line it was relatively easy to control the car, and I was very proud to find myself the driver of a motor car. We were going up hill when I commenced steering, and were travelling at about four miles an hour. On arriving at the top of the hill I felt fully confident on seeing the road stretching straight down hill. I therefore let the car go a little quicker, but suddenly, at the bottom of the hill, I saw a cart drawn across the road. An annoying obstacle, thought I, but doubtless easy to avoid. But when I arrived within 100 yards of the cart, I received a sudden and terrifying demonstration of my inexperience in matters of motor cars. I could no longer find either pedals or levers ! It was absolutely impossible for me to stop my car, which was now going at a dizzy pace. In a few seconds more we should inevitably be on the cart; at all costs this was to be avoided. I gave my steering bar a violent tug to the left, but I could not tell you what happened afterwards. I picked myself up seven or eight yards away, with clothes torn and hands bleeding, covered with dust, but comparatively without great hurt. Behind me I saw the car completely overturned, broken in a thousand pieces, and at first I could see neither my companion nor the chaffeur. It was only on raising the broken bar that I was able to drag my friend from a very perilous position, with a rib broken and seriously bruised. I was, fortunately, able to find a carriage, and we arrived home in a disreputable condition, my lamentable appearance and tattered clothes leaving no doubt as to what had taken place. My wife and my father-in-law, on hearing the story of my adventures, wanted me to swear on the spot, and by all that I held most sacred, that I would never again set foot on a motor car. This oath I did not take as emphatically as I was asked, and I am very glad of it, for if I had bound myself by an absolutely strict promise, I should not be acquainted to-day with the keen satisfaction and pleasure resulting from the sport which you have all tried.

"For some time I did not let my parents know that, before this never-to-be-forgotten outing, I had secured a motor tricycle from De Dion, besides placing an order with Panhard's for my first car. Less than 15 days later I made a triumphal entry into the grounds of my country house on a tricycle. The members of my family wanted me to get rid immediately of this terrible and dangerous engine which, they said, would sooner or later cost me my life This tricycle had, however, only 1-h.p., and could not travel more than 12 to 13 miles an hour on a level road. By steady perseverance I was able at the end of three weeks to ride freely about the park without drawing too many imprecations on my head. Emboldened by this first success, I ventured a short time afterwards to announce to my family the arrival of a 6-h.p. Panhard. It was the first model of the machine, having solid rubber tyres, lever steering, and all the improvements which then characterised the motor car.

"Here is another example of the misfortunes to which an automobilist was exposed in those already far-off times. In October of the same year, 1896, I was invited to shoot with one of my friends whose estate is situated at about 110 miles from Paris. I thought I would do this journey on a motor car, and it was a matter of 10 hours' ride or so. As I was due to arrive in time for dinner the evening before the shooting, I set out at six o'clock in the morning and reached Versailles in an hour. I had run about 10 miles, but the machine had slackened speed considerably, the motor was hot, and the back radiator was giving off a little steam. I had only gone an additional 25 miles or so, when a thick fog came on, and at a turn in the road I mistook a ditch for the road, going right into it! I had to wait at least two hours before the arrival of some country people enabled me to get the vehicle out of the ditch. The car was smashed all to pieces. There was nothing to do but harness a horse to the wreck and haul it to the nearest railway station. I took the train and arrived at my friend's house at half-past one in the morning, instead of reaching there in time for dinner as I had expected. The news of this little accident had spread even to Paris, and on the following morning I had the visit of a gentleman who wanted to know if I would sell him the remains of my car. I was inclined at first to receive him rather coolly, as I hardly expected that he would offer me more than the price of old iron, but you can imagine my surprise when he proposed to pay £520 for a car that had cost only £320, when new, a fortnight before. I accepted this offer with pleasure, thinking that there was something in the old proverb after all that 'It's an ill wind that blows nobody any good.' The accident had by no means cooled my enthusiasm, and my next acquisition was a 6-h.p. Panhard et Levassor car, which represented the latest improvements in automobile construction. This was one of the first cars fitted with pneumatic tyres. It could travel at a speed of nearly sixteen miles an hour on the level, and the carriage body was all in aluminium.

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* A paper read before the Automobile Club of Great Britain and Ireland, on January 9th, 1903.

"On the 20th of October I had invited some friends to a shooting party at Chantilly. I left with the automobile at seven o'clock in the morning, thinking to arrive at about eleven o'clock. As a matter of fact, I got to the shooting at half-past two in the afternoon in a donkey-cart, after having walked more than six miles. Most of my friends had left for Paris by rail, others had decided to wait for me, and instead of killing game, killed time by card playing. I have thus created several enemies, whose feeling of antagonism towards my unfortunate person nothing has been able to obliterate.

"Such were my first experiences with the automobile. Subsequently I possessed several types of cars which were brought out between the years 1896 and 1900. At that early stage of the pastime the motor vehicle was the luxury of a few privileged owners, whom public opinion erroneously regarded as madmen, or, at least, eccentric individuals. There were still only a few amateur automobilists, and the petrol car was making very little progress. It had to struggle against the prejudice of pedestrians, who looked with anything but favour upon the new vehicle, while the noise and vibration, and the smell which it left behind in the streets and through villages were so many causes of complaint against the unfortunate chauffeur. He had to be very careful to avoid being mobbed, for there was always a danger of something going wrong with the car at a critical moment, when the owner might find himself surrounded by enemies who would give him little chance of escape. All this is happily a thing of the past, and while accidents are less frequent, there is nothing to fear from the hostility of the public nowadays.

"In 1899 I was at Nice with one of my uncles, Baron Arthur de Rothschild, who was himself one of the first amateur automobilists, and has rendered some very important services to the motor car industry in France. On climbing the Turbie hill one day, with an 8-h.p. Panhard, we were passed by an enormous motor car which had more of the characteristics of an elephant than of the gazelle, and got to the top of this long gradient some time before us. This easy victory of the elephantine vehicle rather ruffled the equanimity of my uncle, who prided himself on possessing the fastest car turned out at that time. He sought out the owner of the car and proposed to buy the vehicle. The bargain was immediately concluded, and my uncle descended La Turbie with the car which had beaten him on the up-grade, and was now his own property. This car was of German make, and had been coustructed at the Daimler works at Cannstatt. It had a motor of 12-h.p. and weighed over a ton and a half. Its driver was M. Jellineck, whose name is now so well-known in automobile circles.

"Scarcely a fortnight afterwards we were again driving up La Turbie when we heard a loud noise behind us, and suddenly another car passed us, driven by the same M. Jellineck. My uncle was exasperated; another cheque was offered to M. Jellineck, who accepted it. My uncle could not bear the idea of another vehicle beating him on La Turbie, and thus he found himself owner of two Daimler cars, each weighing nearly two tons.

"On making better acquaintance with M. Jellineck, he told us of the projects of the Daimler Company, and asked if we would place an order for the new type of 24-h.p. vehicle which was to entirely eclipse those recently purchased. We decided on giving the order, and we were thus the two first customers for the 24-h.p. car."

(*To be continued.*)

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

INFORMATION AND A CAR REQUIRED.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I wish to purchase or hire a motor car to fulfil the following requirements:—

1. Speed need not exceed 10 to 12 miles an hour. Oil, steam, or electricity as may be found best. Electricity preferred on account of its cleanliness and noiselessness.
2. The car is required for use both in town and country.
3. In the country it will be used chiefly for two journeys per day to the railway station, 2½ miles distant—*i.e.*, about 10 miles per day, and occasionally to the neighbouring town of Tonbridge, 3 miles distant, but of course it may frequently be required for longer journeys.
4. In town it is required for both day and night use. It must therefore be capable of being entirely closed, so as to form a warm, close carriage, excepting the driver's seat, which may or may not be sheltered, for dinner-parties, theatres, &c.; to hold two or preferably three persons besides the driver.
5. There must be room for a small quantity of light luggage.
6. For use in town an electric brougham would, apparently, meet all requirements; but probably this would be quite unsuitable for use in the country owing to the difficulty or impossibility of re-charging it, being three miles distant from the small town of Tonbridge.
7. The machinery must be as reliable and as simple owing to the difficulty in the country of getting repairs executed.
8. The price for purchase or hire must be moderate. I am not disposed to pay a high price for a machine which may turn out unsuitable or ineffective, and which would probably be unsaleable at second-hand.

In regard to any suitable car—electric, petrol, or steam—of which particulars are supplied, I wish to have answers to the following questions:—

(*a.*) A sketch to be supplied.
(*b.*) What is the price, for purchase and for hire?
(*c.*) What trial will be given?
(*d.*) What warranty will be given to a purchaser?
(*e.*) What amount is estimated for annual up-keep?
  1. For repairs.
  2. For fuel, electric current, or oil, &c.
  3. For wages of a thoroughly competent driver.
  4. For housing the car in town, from November 1st to May 1st.
  5. For licence duty for car and driver.

I shall be glad to be furnished with information on all of the above points, either by yourself or by manufacturers or agents of respectability and repute.

Yours, &c.,
CHARLES STEWART.

38, Eaton Place, S.W.
January 12th.

A RACING MAN'S VIEW OF THE PARIS EXHIBITION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have read Mr. Sangster's letter in this week's issue with considerable astonishment. Remembering the days when the Manager of the Cycle Components Company could be counted amongst those sceptical individuals who could not and would not believe in the future of the motor industry, and remembering many of his criticisms on foreign methods of construction, and having seen some practical specimens of how much better many of these things could be arranged if the British brains of Birmingham had the designing, I marvel at his wish now to pose as a champion of foreign design, and also at his decision to copy—one might say blindly—the ideas he has seen shown on some of the stands at the Paris Exhibition.

Perhaps the car he mentioned as being concerned in the manufacture of requires these modernities, but in any event I do not think that the English manufacturers will accept Mr. Sangster's advice in regard to *chassis embouti*, etc., without first having more knowledge and better experience than Mr. Sangster can place at their disposal.

In certain types of cars, where a necessity has arisen for a certain design, I would not and do not suggest that certain apparent complications are necessary to obtain satisfactory running results, but at the same time, to endeavour to build all carriages on the same lines without understanding why, would be foolish.

Mr. Sangster cannot probably understand this, because he would fail to appreciate where the difference between a 16 and a 60-h.p. car comes in, in regard to these questions.

The conclusions I have arrived at, as set out by me in my previous letter, were the result—not of merely looking at certain devices shown on cars which had never even been tried and run, which appears to be the only data Mr. Sangster has to argue upon—but of a long and varied use of many kinds of automobiles, some of them arranged on the lines he wishes all English manufacturers to copy.

Also "the racing experience," which Mr. Sangster scoffs at—why, I cannot imagine, as no one knows better than he does himself how much he is indebted to other people's racing experience—has enabled me to form certain practical conclusions which have been borne out by the drivers of the cars constructed on the lines he champions.

I do not propose arguing the matter with Mr. Sangster, as, although educational from his point of view, this would require space and time. I am nevertheless obliged to him for referring to me so continually as "the racing man"—a fact, as a sportsman, I am proud of—but at the same time I would mention that I personally race, and have always raced, for sport, pure and simple, and my real interest in the motor industry is as a large buyer of cars, both of English and French make, in connection with my own business, and for re-sale to the public; consequently, as an agent spending and prepared to spend money in the purchase of cars, of whatever make I may think best, no one has a more bona-fide right to criticise methods of construction than I have myself.

The opinions I expressed in my previous letter I adhere to: Let the evolution of the perfect motor carriage be on the lines of simplicity combined with efficiency, and let it not be forgotten that the construction should be of such a character that in the event of accident parts can be repaired and replaced easily and cheaply.

I shall view with interest the experiments which Mr. Sangster has decided to make in connection with the cars he mentions—a decision which probably shows a motive for his letter—but I hope that at least the English public and the English manufacturers will not rush after complications—in whatever form—without first forming their own opinions as to their necessity.

Yours faithfully,
CHAS. JARROTT.

45, Great Marlborough-street, W., Jan. 13.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Mr. Sangster's letter in the current number of your journal contains a very large quantity of debateable matter, which boils down into the suggestion that British manufacturers ought to be copyists. This may seem a bare summary of his long letter, but surely the British manufacturer is able to evolve out of his own intelligence some improvements in motor design, and to have his own very decided opinion on the importance of retaining features which have proved to be efficient. The discourse which Mr. Sangster preaches, when deprived of its padding, really amounts to a consideration of whether the three features of the Mercedes which he enumerates are at the moment items for immediate acceptance by the British industry, and by the British users of foreign motor cars.

1. The *Chassis Embouti* may be lighter, stronger, and ultimately cheaper than the old form of frame construction; and Mr. Sangster's reputation as an engineer is a sufficient guarantee of the accuracy of this statement. From the point of view of the manufacturer, the question then arises whether the time has come for the standardization of frames, in view of the fact that so many purchasers of cars wish to have widely differing varieties of bodies, unsuitable for a single standard of frame. At any rate for the present, standardization, like the alleged economy, is out of sight. From the point of view of the owner there is the question of the sequel to accidents. Will the frame resist the fancy manœuvres of an inexperienced user, such as cannoning against lamp-posts, side-slipping on to the pavements, or overturning into a ditch? Neither type of frame will withstand such abuse, but while the broken portion of a built-up frame can be repaired, the pressed steel frame has to be replaced as a complete whole. This replacement means the complete dissembling and subsequent reassembling of the car. What will the unfortunate misuser say when he receives the necessarily enormous bill?

2. Mechanically operated inlet valves. Mr. Sangster questions whether these are more complicated than the atmospheric suction valves, and yet he at once admits that there is a complication. He omits, however, to refer to the wear, which alters the power of the engine, and spoils the exact timing of the valve, and if the timing be incorrect the alleged superior efficiency disappears. The mechanically operated inlet valve may be ideally designed for a certain speed, but it has not yet been proved to have a greater efficiency at all speeds for all engines.

3. The statement that the induced draught type of radiator is more efficient than the old pattern is one not justified by experience, when the car is in motion, whatever may be the heating on a stationary vehicle. Its use reduces the quantity of water carried, but that is not necessarily an increase in efficiency. The old system of radiator has reached perfection so far as efficiency is concerned, and the advantage must be sought in other, and secondary considerations. There are authentic cases of the distance of 500 miles being covered without any necessity for refilling the tank, during the whole of which distance the water has kept perfectly cool. That is complete efficiency. Weight may be reduced, but complication and risks of injury inevitably enter when air is induced through a honeycomb by a fan.

Yours faithfully,
F. T. BIDLAKE.

New Barnet, January 9th.

THE NUMBERING PROPOSALS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Although the proposal to number motor cars is universally condemned, the only alternative at present suggested is to retain the *status quo*. In view, however, of the fact—so it is openly stated—that the Government are going to bring in a Bill next session, which will *inter alia* embrace numbering, I think it behoves us to enquire whether there is no alternative to numbering which will meet the views of the authorities, and I venture to suggest that there is.

I will not occupy your valuable space, either by pointing out in detail how or why numbering has been a failure on the other side of the Channel, or by enlarging on the many objections there are to the proposed system of identification by legible numbering.

I take it that the present position is briefly this: Automobilists are restricted to a maximum speed of 12 miles per hour, and must stop when called upon to do so either by a constable or by a person in charge of a restive horse. Automobilists, as a rule, habitually travel at a greater speed than 12 miles per hour, the majority with due consideration for other users of the road, and a few without any consideration whatever. These latter have obtained for automobilists generally an unenviable notoriety, with the result that the police have, in many places, had to resort to tactics of all sorts to catch these offenders. The result, as we all know, is that more often than not the real offenders escape while considerate drivers have been caught and made examples of. Consequently a kind of feud has sprung up between automobilists and the police, with the result that many drivers, rather than run the risk of a certain fine, refuse to stop when called upon to do so, and if by chance they are held up give false names and addresses. Hence the demand that is being made on all sides for cars to carry numbers sufficiently large to enable them to be identified when in motion.

Assuming the aforesaid to fairly represent the present state of affairs, I venture to suggest that the requirements of the authorities who are clamouring for numbering can be met, and well met, by:—(1) Making it compulsory that all motor cars carry in a conspicuous place a small plate bearing the name and address of the owner of the car (such plate being read only when the car is at rest). (2) Making the owner of a car responsible for the action of whoever may, for the time being, be driving the car, and (3) Making the penalty for not stopping when called upon to do so, a heavy fine for the first offence and imprisonment for the second and subsequent offences. In short, make the car self-identifying as regards ownership when the car is at rest instead of when in motion, and enable the severest punishment to be meted out to those who fail to stop on the demand either of a constable in uniform or of a person in charge of a restive horse. Obviously the sign to be made by a constable as a demand for stopping must be an unmistakable one such, for instance, as holding up both arms at right angles to the body, and it should be made at least 10 yards ahead of the car in the direction in which it is moving.

In addition all drivers should be required to hold certificates of competency to drive.

As a corollary to this scheme, all vehicles the property or manufacturers, factors, agents, &c., out on the road for the purpose of trial or otherwise should be required to display an identification plate.

It will probably be suggested that this scheme provides no means of identification for those in charge of restive horses. Quite true, but these users of the road are surely in no worse position than others who may have cause for invoking the aid of the law and are unable to identify the party or parties giving the ground for such cause of action.

With the removal of the legal limit the *raison d'etre* for police traps will disappear, and consequently the aversion of automobilists to being held up by the police will disappear, and this the more so when drivers realise that a demand to stop will more often than not be made with the object of testing their willingness to comply with the law than with the object of making a charge against them.

In conclusion, this scheme has the advantage that automobilists cannot have charges brought against them for breaking the law without their being made aware of the fact at the time and place of the alleged breach.

Yours faithfully,
Robert D. Phillips.

THREE-CYLINDER MOTORS.

To the Editor of The Automotor Journal.

Sir,—*Re* Mr. Brooke's remarks on the above in your issue of the 10th. He evidently considers that the importance of balancing depends, in some way not clear to me, on whether a motor gives two impulses in one revolution or one impulse in two revolutions, and that the importance is vital in the former, which is supposed to be a steam motor. Yet he evidently attaches some importance to the balancing of petrol motors (Otto Cycle), as a point is made of the balancing of the 3-cylinder motor; now, if he would kindly favour your readers with his definition of the term balanced, his meaning would be quite clear.

Taking the accepted meaning of the term balance, it is a matter of indifference whether the motor gives two impulses per revolution or one impulse in two revolutions, or none, that is, the motor, instead of driving, may be driven, and the effect of unbalanced inertia forces or couples would be the same in each case, provided the weights, turns per unit of time, and stroke are identical, and as the torque is a function of the impulse, it also does not enter the question of balance.

What ought to determine the importance of balancing is the manner in which the motor is supported. For instance, a steam motor carried on a massive and rigid foundation need not be accurately balanced, as the amplitude of the vibration is damped by the mass of the foundation. On the other hand, if the steam motor be carried on a light and elastic foundation, the importance of balancing becomes vital, as the amplitude of the vibration may even be augmented under certain conditions; now, as the petrol motor under consideration is carried on a light and elastic framing, it would seem a matter of vital importance that it should be balanced in the best-known manner.

Although impulse vibrations are outside the question of balancing, it appears to me that they somehow underlie Mr. Brooke's remarks in your last issue, and as their consideration gives a greater reason why 3-cylinder motors should not replace those having four cylinders, it may be as well to briefly notice them. In the petrol motor on the Otto Cycle, the amplitude of the vibrations due to the angular accelerator of the flywheel mass, the measure of which may be considered as being proportional to the impulse, may greatly exceed the amplitude of those due to the unbalanced inertia forces and couples due to moving masses other than the flywheel. There are roughly two distinct sets of vibrations set up in the frame or foundation, and our aim should be to reduce them to their lowest value.

We may, by using a 4-cylinder motor in place of one having three cylinders, reduce the impulse vibrations in the proportion of 3 to 4, and at the same time reduce the vibration due to the reciprocating and revolving masses to a small valeu. The motors are understood to give the same power at the same turns per minute, and to be governed in the same manner. It should not be overlooked that the greatest discomfort may be produced by vibrations having a low amplitude and high frequency, and if such be the case, vibrations produced by unbalanced inertia forces or couples may produce discomfort equal to or even greater than that produced by impulses.

Thanking you in anticipation,
I am, Sir,
Yours truly,
Paisley. B. A. Lance.

An attempt to utilise motor car enthusiasm in a rather extraordinary way was chronicled recently by the *Birmingham News*. An individual of the name of Foley held a meeting at the Friend's Institute, Northfield, last week and claimed to have invented what he termed a "manual motor," which is to revolutionise self-propelled traffic generally. He didn't explain what it was. In fact he refused to explain. But he wanted people to put down their money and go into "pardnership" with him. Inhabitants of the neighbourhood of Birmingham are not quite silly enough to buy a pig of this sort in a poke. Mr. Foley is still looking for "pardners."

An Ulster branch of the Irish Motor Cycle Union has been formed at Belfast.

Mr. E. W. Hart, of Luton, was elected a member of the A.C. de France at last Monday's committee meeting.

No. 34 in the Queen's Palace is The Automotor Journal stand at the Stanley Exhibition at Earl's Court.

The Hart Accumulator Company, Limited, of Stratford, E., have sent us a useful desk blotting pad for the year 1903.

It has been agreed by the Surrey County Council to allow speed notice boards to be erected by the Automobile Club on the Portsmouth Road.

As an indication of a prosperous season for the motor bicycle, the Ormonde Motor Company have found it necessary to considerably enlarge their staff, especially for assembling and finishing their machines.

The North British Rubber Company, Limited, announce that they have made arrangements to supply motor pneumatic tyres in the United Kingdom made by MM. Michelin and Co., under the name of "Clincher-Michelin."

Four Cantor lectures on "Mechanical Road Carriages" will be given by Mr. W. Worby Beaumont, M.I.C.E., at the Society of Arts, on April 27th, May 4th, 11th, and 18th. On next Wednesday the metric system will be dealt with before the Society by Mr. A. Sonnenschein.

Thirty of the new 18-h.p. Mercedes cars have been secured by Mr. Harrington Moore. Mr. Moore is prepared to commence delivery of these about May next to those who are fortunate enough to arrange for one of these new type of car.

The motor fire-engine, which we fully described in The Automotor Journal for October 4th, built under the direction of Captain Wells, has been located at the Carmelite Street Station in the City, and for the future is to be held ready for regular service.

Sir Martin Conway is a believer in the future of Automobilism. Addressing members of the Cyclists' Touring Club on Monday evening, he humorously predicted the time when the motor bicycle would be the universal means of getting about, trams being relegated to the conveyance of invalids and coal.

In addition to the acquisition of the 22-h.p. Daimler car which Mr. Oliver Stanton has arranged for the King, he also last week concluded arrangements for one of the latest types of the same make and power to be supplied to the Prince of Wales. Several special features will be introduced into the finished car, and the identical chassis, in addition to the carriage on order for His Majesty, will be on view at the Crystal Palace Automobile Show at the end of the month.

Mr. W. M. Letts, the energetic representative of the Locomobile Company in London, although so much interested in American-made vehicles, holds no half-hearted views in regard to the capabilities of the British-made car as against the American. During his recent visit to the States he has not hesitated to inform the American people that against the Napier car in the Gordon-Bennett Cup race they stand no chance whatever of securing the trophy.

A MOTOR TYRE booklet is to hand from the Dunlop Pneumatic Tyre Company, Limited, which should prove of considerable use to automobilists, as it gives minute details and practical hints upon the repair and care of pneumatic tyres. The record of the present make of Dunlop pneumatic tyre places them well in the front for this important "accessory." Last year's Gordon-Bennett Cup Race was won on a single set of tyres without a puncture throughout the race, whilst Mr. Jarrott's record kilometre time of $28\frac{1}{5}$ secs. at Welbeck was also run on this make.

THE misfortunes of the owner of the motor car that was started by a mischievous boy in Wandsworth, and while pursued by the driver Cockles invaded not inappropriately a fish shop, appear to be perennial. A lady of the name of Chipp (another good name, as pieces seem to have been knocked off her by the offending vehicle), one of the nine injured, recently recovered £8 10*s.* for personal injuries from Mr. Claude Lavita, the owner. We sincerely trust this will be the end of the business, and that the unfortunate proprietor will not have any further sums to disgorge for what was in no way his fault.

THE Eastern Counties Automobile Club is in course of formation at Ipswich, the membership to include automobilists in Norfolk, Suffolk, Essex, Cambridgeshire, and Hunts. It is proposed that the subscription should be one guinea per annum. The secretarial duties have temporarily been undertaken by Mr. Egerton. A Norfolk Automobile Club, with headquarters at Norwich, is also being organised, it being considered by some of the local motorists that a club with headquarters so far away as Ipswich would hardly meet the requirements of Norfolk automobilists. Mr. G. N. C. Mann, of 2, Redwell Street, Norwich, is looking after the preliminary work until a permanent secretary is appointed.

A BOLD bid for support by traders, doctors, and others is being made by the Motor Hiring Syndicate, Limited, of Winchester House, E.C. They propose acquiring a number of first-class and reliable motor vehicles, supplying driver, fuel, lubrication, and repairs, and, in fact, taking all risks, charging an inclusive sum per week for the entire use of the vehicle. Under this system they are prepared to take orders to supply fifty heavy motor lurries, capable of dealing with the heaviest loads, or a lighter type capable of handling 2-ton loads, whilst lighter delivery vans carrying one ton and half a ton will be available for hire. Private passenger vehicles will also be dealt with in the same manner, either for one person besides the driver, or capable of taking parties of six or eight passengers. If properly carried out the scheme should be a splendid success, and should induce a considerable number of firms and others who have been hesitating for some time to give automobilism a thorough trial.

AN industrial alcohol section will be a feature of the Brussels Automobile Salon, opening on February 7th.

PRINCE HENRY OF PRUSSIA has accorded his patronage to the Berlin Automobile Exhibition, which will be held in March next at the Flora Garten.

THE first American automobile speed road has, it is announced, just been completed at Lakewood, N.J., by the Lakewood Hotel and Land Association. Its length is about $1\frac{1}{4}$ miles.

FOURNIER arrived in New York last Monday, and promptly issued a challenge to race Alexander Winton any distance from one to five miles, either on the track or the road, at Winton's choice.

MISS ODETTE TYLER, an American actress, is credited with having invented a patent dust-proof automobile mask, which, if it does not do all that it is credited with by the Transatlantic Press, should at least serve Miss Tyler's purpose of securing a big free advertisement.

WE recorded at the time of its occurrence the elopement from Paris by motor car of Dr. Marcile and Mdlle. Le Play. The sequel was enacted on the 7th inst., when the pair were happily united in marriage, the parents of the young lady having apparently accepted the inevitable.

IT would appear that official authorisation of motor road races in France does not necessarily mean that the races will be allowed to be held. A case in point is the "Coupes de Pioule" meeting, announced under the auspices of the Automobile Club of Var, and duly authorised for last Sunday, as, at the last moment, the authorisation was withdrawn and the meeting abandoned in consequence, much to the indignation of the twenty-two entrants who had arranged to compete.

JUST now, when the not unexpected collapse is announced of the "Passe Partout" tour round the world, is selected by the *Petit Bleu*, a Paris newspaper owned by M. Deutsch, as an opportune moment to set forth the details of another proposed journey round the globe by automobile. Minute and fascinating as the details are as given by the *Petit Bleu*, we doubt there being any practical outcome of the announcement, in spite of the money which even M. Deutsch could afford to lavish on such a wild enterprise.

FEELING runs high in American automobile circles in regard to the claim made by *Automobile Topics* that their daily journal during the New York and Chicago shows will be the first automobile daily published in the English language. A writer in the *Automobile Magazine* waxes wroth on this matter, and points out that "the *Motor Age* daily, which he (the writer) assisted in getting out two years ago in Chicago, was not published in French, or Yiddish, or Bohemian, but it was in plain Chicagoese," which he considers is good enough to hold the record in this matter.

LAST week we drew attention to the automobile service recently established in Italy between Spoleto and Norcia. In several other districts public automobile services are being established in that country. Another linking up of towns by a similar cross-country service is announced between Orvieto and Albegna on the shores of the Mediterranean, a distance of 117 kilometres. A number of small towns are by this means served directly, including

Osteria-Biacio, Saint-Lorenzo-Nuovo, La Rotta, Pitigliano, and Manciano, to reach which has hitherto entailed considerable loss of time.

April 11th is the date appointed by the Automobile Club of America for the selection of the competing cars which are to represent America in the Gordon-Bennett Cup Race for 1903.

Should it be necessary to run the Gordon-Bennett Cup Race on French soil, and it is run off in connection with this event, some good times should be scored, as a stretch of over 200 kilometres has been located which could be covered without any neutralised portions.

Alexander Winton does not think it right that the A.C. of America should entertain any applications from untried makers of motor vehicles to represent America in the Gordon-Bennett Cup Race. In any event, he proposes to the Race Committee that only established manufacturers should be recognised in making a selection of entrants in the event of a choice being made without an eliminating trial.

The "Circuit Français," which is being organised by the Chambre Syndicale de l'Automobile, will take place during July. This race will be run over a course of about 400 kilometres in the French Ardennes north-east of Chalons near Sainte Ménehould and Vouziers, and will be arranged without any neutralised portions or stops on similar lines to the Belgian Circuit des Ardennes. The classification will be based upon the capacity of the cylinders instead of weight.

The first day, February 22nd, of the Pau Automobile Week will be devoted to a big road race to Ger and Garlin (225 kiloms.); on February 24th the speed mile and speed kilometre will be run off; on February 25th a big hill-climb will take place on one of the steep grades of the Pyrenees; and on February 26th a fuel consumption competition for tourists will be held. With their usual courtesy, *L'Auto-Velo* announce that they will advance the date of their consumption trials by three days when the official authorisation of the Pau events is announced, so that competitors may not be excluded from taking part in both fixtures.

Although the Circuit des Ardennes will probably not be held until August, next to Paris-Madrid it already promises to be the leading Continental event, mainly due to the fact that it is a race without any neutralisations or compulsory stops. Already the engagements total up to about 50. Besides the entries of Messrs. Charles Jarrott, Mark Mayhew, S. F. Edge, and others which we have already notified, amongst the latest additions to the list are six Mors and six De Diétrichs, all in a batch, three Aders, a heavy car by Baron de Crawhez, and four Voiturettes Pipe, for which make of car the London Motor Garage Company represent Great Britain. In the motor bicycle section, the Minerva Company head the list with three entries.

Commencing on April 16th, a competitive run has been arranged by the Automobile Club of Touraine for tourist vehicles. The points determining the winners will be the comfort and appearance of the vehicles, absence of noise, ease of working, and accessibility of the motor and working parts, in addition to regularity of running and speed. The first day's run on April 17th will be about 150 kilometres, and a similar distance on the next day, which will include hill climbs and a speed kilometre. All competing cars will have to take part in an exhibition held the next day, April 19th, and finally, on the 20th, a pleasure run will be made to Chambord Castle, where *dejeuner* will be served, followed by "dislocation générale." In all probability during the same meeting a competition of headlights for automobiles will be arranged.

One of the most enterprising provincial automobile clubs in France is that of Rhone. The annual automobile congress was the original idea of this body, and they announce an Automobile Week from July 5th to 12th next at Aix-les-Bains, when the height of the season at this favourite resort is in full swing. The events will include for racers, speed mile and kilometre competitions, a hill climb on the Laffrey Hill, and a road race from Montmelian to Albertsville and back. Authorisation for the latter event is almost a foregone conclusion, as the road traverses for the most part a practically uninhabited district. Tourist cars will also be catered for. Arrangements will be made for the run from Lyons to Aix to be made in a mass, *viâ* la Grande-Chartreuse, and an automobile paper chase will be organised over a course in the vicinity of Aix of about 125 to 150 kiloms., and finally a "Concourse d'elegance" will be held, winding up with a Battle of Flowers. The entry fees for the three speed events are 150 francs for heavy cars, and 100 francs for light cars, voiturettes, and motor cycles. The entry fee for the tourist event is 25 francs.

The Paris-Madrid Race will be run on May 24. M. Tampier, as official delegate of the A.C. of France, is examining the suggested routes for the race. M. Tampier, on his tour of inspection, is making use of one of the new De Dion-Bouton "Populaires." Both Mr. Charles Jarrott and Mr. Mark Mayhew gave notice of entry for this event last week, although the entry list was not formally opened by the A.C. de France until Thursday, January 15. The order of starting will be determined by the drawing of lots, and therefore no advantage will be gained by being first on the list of engagements. This may possibly account for many of the prominent French makers not having made the usual mad rush to be the first to get their forms of entry to the Club authorities. Entries can be lodged either with the A.C. de France or the recently-established Royal Spanish Club at Madrid. The drawing of lots for order of starting of all entries received between January 15 and February 15, will take place about February 16. Entrants commencing with that date up to April 15 will start in the order in which their entry is received. The fees payable are Category I. (Motor bicycles, 50 kilogs.), 50 francs; Cat. II. (Voiturettes, 250 to 400 kilogs.), 200 francs; Cat. III. (Light cars, 400 to 650 kilogs.), 300 francs; Cat. IV. (Heavy cars, 650 to 1,000 kilogs.), 400 francs. After April 15 all fees are doubled and the lists finally close on May 15.

The third annual consumption trial organised by *L'Auto-Vélo* will take place on February 19th over a distance of 100 kiloms., and will comprise six categories, viz., voiturettes, light cars, cars up to 1,000 kilogs., and heavy cars over 1,000 kilogs., and, in the commercial section, vehicles carrying less than one ton, and vehicles carrying over a ton. Special provision will be made in the classification in order to decide the respective economic values of petrol and alcohol, having regard to the selling prices of these fuels inside and outside Paris. In each category the order of merit will be decided by the smallest fuel consumption, and in the industrial section for the smallest fuel consumption in relation to the weight transported, and, secondly, according to the ton-kilom. The judges will be Messrs. G. Forestier, C. and F. Longuemarre, Leprêtre, R. Périssé, and Famechon. The three first entries in this competition, as we announced on January 3rd, were three Gillet-Forest cars, and these have been quickly followed by three Delahaye cars, three Hautiers, two Sage vehicles, four Mors, and four Chenard and Walchker's, the latter being the vehicles which made such splendid consumption records last year in the French Government Alcohol Trials. A surprise has come in the entry of a Thornycroft steam wagon, the consumption of fuel of which has been specially arranged to be taken by the organisers of the trial. A number of prizes will be offered, and a special one will be awarded for the carburettor used by the winning vehicle in the general classing for the ton-kilom., the manufacturer of the fuel used by this car receiving a similar award. The record minimum fuel consumptions per ton-kilom. to be beaten are:—Voiturettes: Peugeot ·089 litres. Light cars: Darracq, ·0646 lit.; De Dion-Bouton, .0731 lit.; Korn, ·0750 lit. Cars: Chenard and Walcker, ·0514 lit.; Bardon, ·0704 lit. Cars over 1,000 kilos.: Delahaye, ·0734 lit. Industrial Vehicles: De Diétrich Omnibus, ·0744 lit.

The Automobile Club Reliability Trial for 1903 will probably start on September 4th, the distance being 966 miles spread over eight running days. The suggested runs are from the Crystal Palace and back, to Folkestone (146 miles), Margate (130), Southampton (138), Brighton (87), with speed trial at Brighton, if possible; Bexhill (121), Worthing (120), Eastbourne (120), Southsea (134). Classification will be by price, viz:—Class A, up to £200; Class B, £300; Class C, £400; Class D, £550; Class E, £700; Class F, £900; Class G, over £900. Each day's run will include, if possible, one hill climb, times to be taken whilst the cars are running, instead of stopping at the bottom of the hill. Dropping a passenger will entail loss of all record and marks for that hill. Noiselessness, accessibility, and absence of dust-raising will be taken into account.

It is, perhaps, a relief to know that there are places in the world in which on occasion the high-speed motorist is treated even worse than in the county of Surrey. In the Principality of Monaco the authorities have recently been running in motorists accused of furious driving in regular batches. The procedure is simple. The offender is brought before a commissaire of police, who, after hearing the case, promptly inflicts a fine, usually of 1,000 francs (£40), and the motorist has to pay up before he is set at liberty. Visitors to the principality only too frequently drop a good deal more than this in another way, but, then, they are supposed to have some fun at the roulette table for their money.

Several months ago we gave publicity to rumours, then first started, of a scheme for building a Motodrome near Berlin. Particulars more or less vague have been filtering through the Press ever since, and although in some quarters it is spoken of as a certainty, there appears to be a considerable amount of doubt existing as to the final upshot of the business. It is even stated that the Emperor William has taken the matter up officially and favours the construction of the course in the Grünewald. In other directions amongst those who are credited with more minute knowledge of the facts, this 12 kilometre Motodrome is said to be in the air, and that the whole of the schemes will probably resolve themselves into an Autodrome of about 2,000 metres in length, with an inner cycle track 666 metres in extent, identical with the Paris Parc des Princes. A company, with the title "International Sportpark Autodrom," has actually been formed for this project, and the Autodrome is to be at Friedenau. The date for the inaugural automobile races is given as April next.

A meeting of the British Motor Company, Limited, will be held on February 4th at Chiswell House, London, E.C., to receive an account of the winding-up.

The Directors of Bayliss, Thomas, and Co., Limited, at their annual meeting last week attributed the debit balance of £1,088 shown on the balance sheet, to their experiments with and advertising the "Excelsior" motor bicycle. The shareholders, however, were reassured by the statement that as a result of the work done in this direction and of the valuable records which had been achieved by the "Excelsior" machine, the Company possessed one of the finest motor bicycles on the market, and that the prospects for the coming season were satisfactory and encouraging both as regards sales effected and orders in hand.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Imperial Cycle Company (Limited), Imperial Works, Hack Street, Birmingham.—Capital, £1,000 in £1 shares. Object, to carry on the business of cycle, carriage, motor car, motor cycle, machine, and vehicle manufacturers and merchants, engineers, &c.

Quemby Brothers (Limited), carried on by J. J. Quemby, at 324, Wandsworth Road, S.W.—Capital, £1,000 in £1 shares. Object, to acquire the business of wheelwrights, tyresmiths, coachmakers, van builders, carriage and motor car manufacturers, engineers, &c.

Rowley's Bothways Gear Syndicate (Limited).—Capital, £600 in £1 shares. Object, to manufacture and deal in Rowley Bothways gear free wheel or other appliances for cycles, and to carry on the business of cycle, motor car, vehicle and accessory manufacturers, &c.

Steelband Tyre Company (Limited).—Capital, £1,000 in £1 shares. Object, to carry on the business of manufacturers of an dealers in tyres and rubber goods, iron merchants, wheelwrights, &c.

NEW INVENTIONS.

Claiming particularly to apply directly or indirectly to Motor Vehicles, &c.

Patent Specifications Published.

Applied for in 1902.

Published January 15th, 1903.

1,762. S. H. Short. Heat engines.
2,139. Pick Motor Company (Limited). Driving or transmission gear.
2,972. Tangyes (Limited), and Robson. Internal combustion engines.
3,129. E. Field and others. Explosion engines and motive fluid therefor.
3·335. D. Roberts and C. James. Oil or hydrocarbon engines.
3,995. D. Joy. Valves or ports and pistons.
5,826. C. W. G. Higgs and V. D. de Wet. Mechanically-propelled vehicles.
5,987. S. S. Straker. Differential gear.

THE AUTOMOTOR JOURNAL

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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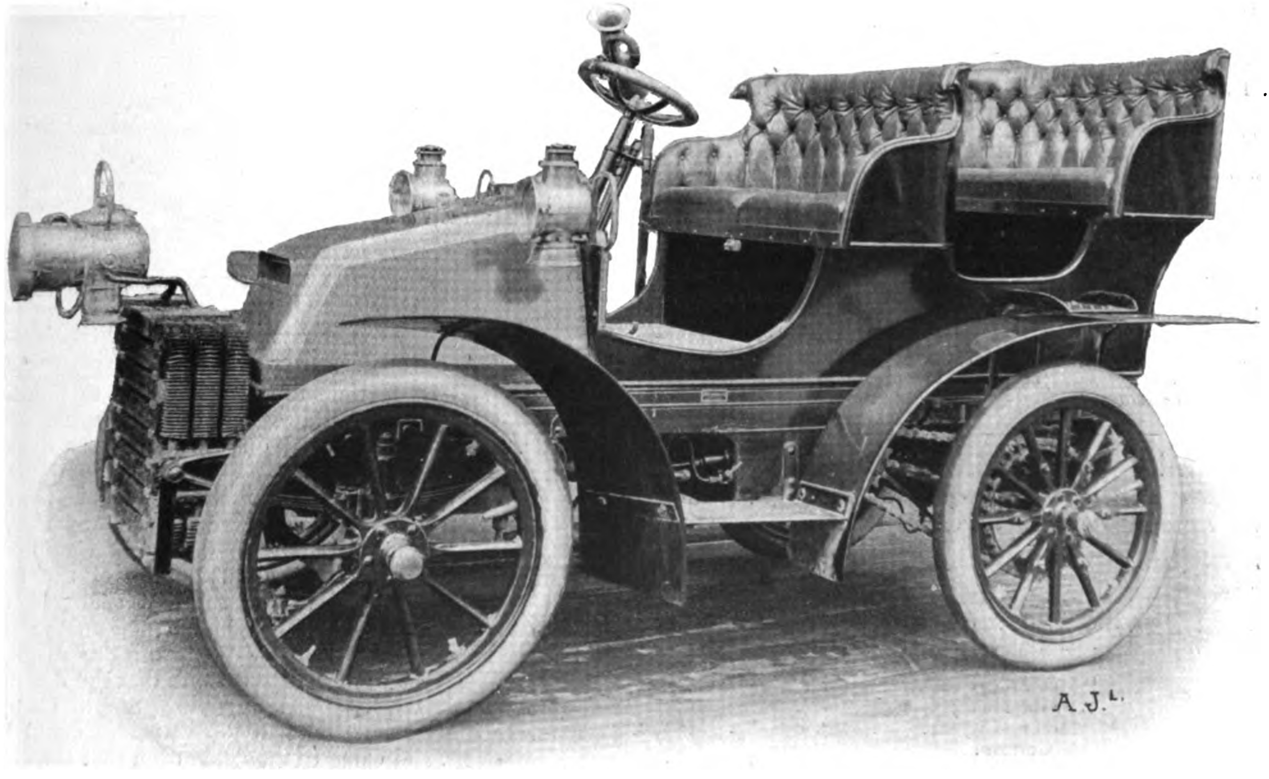

A 10-H.P. MIESSE CAR, 1903 TYPE—BUILT IN ENGLAND.

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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.	
Jan. 23 ...	... "Motor Cars for Men of Moderate Means." Paper by Captain Kenneth Campbell.
Jan. 24 ...	... Quarterly 100 Miles Trial.
Jan. 30 ...	... "Lubricators and Lubrication." Paper by Mr. Thomas Clarkson.
Feb. 13 ...	... "Motor Cars as Feeders for Railways." Paper by the Hon. J. Scott Montagu.
Feb. 20 ...	... "Motor Bicycles." Paper by Mr. Mervyn O'Gorman.
Feb. 27 ...	... "Recent Development in the Modern Automobile." Paper by Mr. H. R. Sennett. Annual General Meeting.
March 13...	... "The Motor Problem a Road Problem." Paper by Mr. W. Rees Jeffreys.
August ...	... Tourist Motor Bicycle Reliability Trial.
September	... The 1,000 Miles Trial.
1904	... Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
Jan. 16-24	... Stanley Club Motor Show at Earl's Court.
Jan. 30-Feb. 7	... Exhibition, Crystal Palace.
Feb. 3-7...	.. Liverpool Cycle and Motor Show.
Feb. 6-14	... Edinburgh Motor and Cycle Show.
Feb. 7-16	... Brussels Automobile Salon.
Feb. 9 ...	... Competition of Timing Apparatus (A. C. de F.).
Feb. 13-21	.. Manchester Cycle and Motor Show.
Feb. 19 ...	... Consumption Trials (100 kiloms.) *L'Auto-Velo.*
Feb. 22-28	... Pau Automobile Week.
March ...	... Competition of Silencers (A.C. de F.)
March ...	... "Criterium du Quart de Litre" (*L'Auto-Velo*).
March 1-15	... Berlin Automobile Exhibition.
March 16-30	... Vienna Automobile Exhibition.
March 21-28	... Cordingley and Co.'s Exhibition, Agricultural Hall.
March 21-28	... "Criterium des Transports Automobiles." 1,095 kiloms. (*La France Automobile*).
March 28-April 5	Nice Automobile Week.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 24 ...	... Paris-Madrid (A.C. de France). Entries until May 15. Double fees April 16 to May 15.
May ...	... Gordon-Bennett Cup Race.
June 22-24	... Automobile Club Fêtes—Paris.
July 5-12	... Aix-les-Bains Auto Week (Auto Club du Rhone).
July 19 ...	... Circuit Francaise. 400 kiloms. (Chambre Syndicale de l'Automobile).
August ...	... Circuit des Ardennes.
Oct. 15-21	... Leipzig Exhibition.

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PASSING EVENTS.

ENLIGHTENED SCOTLAND.

WE have had from time to time occasion to point out that some of the Magistrates and officials north of the Tweed are more enlightened on the motor car question than their southern colleagues. Possibly in Scotland the fines gathered in Police Courts do not go to reduce the local rates to the same extent as in England. At any rate, we have pleasure in adding the name of Sheriff Campion to the small but deserving list of functionaries of the Police Court order who allow common-sense a share in their decisions. Mr. Hugh Fentie was summoned on the usual charge, and all the witnesses agreed, with the suspicious unanimity customary on these occasions, that the defendant was going at exactly 23 miles an hour. Sheriff Campion considered it impossible that all the witnesses could have been mistaken, and came to the conclusion that the charge was proved, but as the technical offence was committed on a country road with nobody about, he dismissed the defendant with a warning. While we agree with the spirit displayed by the sheriff, we venture to think that he showed ignorance of the class of witness with which he had to deal. It may not have been likely that all the witnesses were mistaken, but there is, unfortunately, as we know too well, another alternative, and that the sheriff seems to have neglected. Where a magistrate finds a case proved he is in this country bound to convict, and if a similar decision were given here the prosecution could get a *mandamus* against the magistrate from the Court of King's Bench. For the benefit of any magistrates of the same unprejudiced character as Sheriff Campion, if such there be south of the Tweed, we would point out that the proper course in such cases is to convict, but to inflict a merely nominal fine. There can then be no question of *mandamus*. A disagreeable feature of the case was the appearance of a rabbit trapper in support of the police evidence. Rabbit trappers are persons on whom the police are only too likely to have a hold. They are closely akin to poachers, and we do not think such evidence should be accepted. The rabbit trapper in question was evidently a "Mr. Facing-Both-Ways" as well, for he accepted a lift from the defendant, and then turned police evidence against him afterwards.

THE GRÜNEWALD RACING COURSE.

WHETHER there is or is not to be a course for automobile racing established in the Grünewald near Berlin seems to be somewhat uncertain. Last week the rumours were rather against it, and the German Press burst forth into quite a torrent of eloquence in denouncing the iniquity of defiling the beautiful woodland by the puffing and smelling of the automobile. This smell myth dies hard. But it is amusing to see that opposition to the automobile unites in brotherhood such opposing organs of opinion as the ultra-conservative Jew-baiting, agrarian *Kreuzzeitung* and the social democratic *Vorwärts*. This week the rumours converge towards the probability of its construction, and there seems to be little doubt of the sympathy entertained by the Kaiser for the project as referred to by us last week. He is an opponent of reckless driving on the road like all sensible people, but he is much interested in automobile racing, and he is far from pleased at the greater general success which has been attained by France in this particular line of sport. A good racecourse for automobiles in Germany would go a long way towards giving both manufacturers and drivers the experience required for successfully competing in the great events, and we hope therefore to hear, in spite of the *Vorwärts* and the *Kreuzzeitung*, that the project will soon be carried through.

MR. STAPLEE FIRTH AND THE GARDEN OF EDEN.

THERE does not at first sight appear to be much connection between the two subjects forming the heading of this paragraph. Mr. Firth is, as most automobilists are aware, a brilliant fighter, and when whipped into enthusiasm in police courts by the bovine stupidity and prejudice of magistrates, and the absurd nature of the evidence which is frequently tendered by the police for the consumption of those functionaries, and by them swallowed with apparent gusto, he occasionally rises to the heights of real eloquence. The other day Mr. Firth was defending an automobilist from the usual charge, and Police Constable Mungo Park, of the A Division (the agents of the law have weird designations occasionally), maintained that the defendant had covered 2 miles 5 furlongs 51 yards in five minutes. Mr. Firth elicited that the constable had not personally measured the distance, and all his evidence merely proved that the car was travelling faster than the other traffic. Then Mr. Firth's eloquence carried him away, and he denounced in scathing terms the flimsy nature of the evidence on which gentlemen were dragged to Court by the scruff of the neck and their noses thrust into crime whether they would or not. Motor cars, of course, being a modern invention, went faster than the animals used by Adam and Eve in the Garden of Eden, upon whose speed no improvement (for purposes of domestic traction, we presume) was made until the introduction of the automobile. This is not only very picturesque, and for practical purposes absolutely the truth, but at the same time the idea of Adam and Eve, after naming the zebra or the giraffe, harnessing these animals and running races with them round the sacred precincts hardly accords with the air of deadly propriety with which the subject is usually invested —at any rate in Sunday schools.

RATHER CHEAP FOR A CELEBRATED MAN.

THERE is a growing tendency at the present day among a good many people to mistake for humour what is only infinitesimally removed from silliness. Of course, to a great Alpine climber cycling may appear a very poor sort of sport, and he is quite welcome to that opinion if he holds it; and perhaps there may be something funny in trotting out the notion before the Cyclists' Touring Club. It is like running down the law in the presence of a judge rendered harmless by afternoon tea. But when Sir Martin Conway says he hates cleaning bicycles, has not cleaned his for five years, and that though other people may take money for cleaning them he does not believe that bicycles are ever cleaned, we think that only a very much after-dinner frame of mind could have raised a laugh at the statement. The educative value of the bicycle in gradually interesting a lot of people, who would otherwise have remained stupid all their lives, in elementary mechanics is unquestionable. We have pointed out frequently that the motor car exercises a similar influence to a much greater degree, but if people are to adopt Sir Martin Conway's attitude they will benefit neither by one nor the other. We did not know before that climbing mountains made people anti-mechanical. If it does we would prefer to see them remain on the level and be run in for scorching on cycles or fined for exceeding the legal limit on motor cars in Surrey or elsewhere. It would be better for them, and we believe ultimately for the community.

FOR THE GORDON-BENNETT RACE.

VERY commendable energy, initiative and tact has been displayed by the Automobile Club as regards the preparations for the Gordon-Bennett Race. Following the action of the Club Secretary in taking Count Zborowski and Messrs. Edge and Jarrott over the course, a well-chosen letter has been addressed by the Club Chairman to all the Irish Members of Parliament, while a similar communication is being sent to the County Councils and local authorities through whose dominions the selected course will pass. Already the West Meath and Queen's County County Councils have on their own initiative expressed their warm approval of the project. This is a most favourable omen, and doubtless the other local authorities will adopt a similar attitude if properly approached. Knowing the country we would again suggest that steps might also be taken to interest the local priesthood in the Race. They are good friends to have on one's side, and their local influence is enormous.

THE TOLEDO STEAM CAR.

THESE vehicles, which are manufactured by the International Motor Car Company, in the States, have recently made their appearance in this country. Although in general respects of the American "runabout" type, they possess many features which differ from those in other models which are better known in England. The Toledo is by no means a lightly built vehicle; it weighs 1,500 lbs., and the underframe, which is tubular, is of very strong construction. The leading characteristics of the car are the special form of boiler with which it is fitted, the type of valves with which the engine is provided, the form of burner and vaporiser which are employed, the use of a single lever for operating the throttle valve and the reversing gear, the automatic system of lubrication which is adopted, the arrangement of the feed-water-heater in combination with the silencer for the exhaust steam, and the construction of the steering tiller so that it forms a lever for operating an auxiliary feed-water-pump. Another feature of these cars is that the makers paint the various pipes and parts in different colours, according to their uses, and thus enable the novice to distinguish them without much trouble. In accordance with this system, the petrol tank and the pipes which contain petrol are painted red, the water connections are blue, the steam pipes are white, and the air vessel and its connections are coloured green.

Toledo cars are made in five different types, the chief differences between them being the bodies. The two-seated car, without hood, is seen in Fig. 1, and other views of the same vehicle shown in Figs. 2, 3, and 4. Fig. 2 is a view from beneath, showing the general arrangement of the mechanism. Figs. 3 and 4 are reproduced from photographs taken from each side of the car; they show the engine and other parts beneath the driver's seat.

The underframe consists of two large tubular reaches, which connect the front and back axles together. They are well stayed at each end, and are made of thick seamless steel tubing. The rear axle is of much the ordinary "live" type, and is rendered rigid by an arched tube which passes over the differential. A forked distance rod passes from the crank chambers of the engine to the framing surrounding the differential; provision is made by which the tightness of the chain can be adjusted by it. Two band brakes act upon the shell of the differential gear, one of them on each side of the central chain-wheel. The two bands are operated simultaneously by a foot-pedal, and they are so constructed that they will hold the car both forwards and backwards. The front axle is also tubular, and it is stiffened by a parallel stay which passes across beneath it. The body is suspended above the underframe in front by transverse springs, the one of which is pivotally attached at each end to the axle, and the other has its ends connected to the body; the two springs at their centres are joined together. The rear springs are arranged on each side of the body, and are of the double elliptic type.

The engine is fixed in much the usual position beneath the driver's seat. It is pivotally connected to the body by a ball joint at the top, and is held in position, otherwise, by the distance rod passing to the back axle which we have already mentioned. The engine is of the 2-cylinder, double-acting, high-pressure, vertical type, and, as seen in Fig. 5, it is provided with piston valves. The bore of the cylinders is 3 in., and the stroke 4 in.; the normal power is 7½ h.p. The cranks, eccentric blocks, and the central sprocket are made from drop forgings. No ball bearings are used, the bearings carrying the crankshaft are of the ring lubricator type, and that shaft is 1⅛ in. in diameter. The valves are operated by the usual link-motion reversing-gear. The valve stems are connected to the guide pieces, which operate them, by ball joints. The connecting-rods and cranks are entirely enclosed in crank-chambers, and the lubrication of the parts is effected on the splash principle; the connecting rods have scoops provided at their ends for throwing the oil up on to the various parts. The cross heads for both cylinders are connected with the plungers of pumps, fitted to each side of the engine and enclosed in dust-proof casings. The one pump feeds water to the boiler, and the other maintains the air pressure on the fuel tank. The cylinders are automatically lubricated from a pressure tank having a capacity sufficient for running 150 miles. The oil is gradually fed from the tank by the pressure of steam in the boiler. The cylinders are fitted with relief cocks for allowing any condensed water to escape when starting the engine.

The boiler is fixed to a tubular framing in the body, and lies immediately behind the engine. It is 19 ins. in diameter, and is of special construction. It consists, as seen in Fig. 6, of an inner and outer shell, between which is an annular water space. Several lengths of weldless steel tube are wound spirally to form a central coil inside the inner shell, and the lower and upper ends of these tubes are fitted into the side of the shell, so that they lead from near the bottom of the space between the two shells and return to the top of it. The flame from the burner passes up through the tubes and causes a very rapid circulation to take place through them. The shape of the tubes gives the water a whirling motion in the annular space between the shells; deflector plates are fitted at the mouths of each tube so as to direct the water through them. It is claimed that by this construction the same rapid generation of steam is effected in the tubes as in a flash boiler, and that the capacity afforded by the annular space also secures the benefits obtained with boilers having a water space and a space for the storage of steam. The rapid circulation is said to prevent any deposit from settling anywhere except at the very bottom of the annular space; this is easily displaced by the blow-off cock fitted at the lowest part of the boiler. A water gauge of the Klinger type is fitted in the usual position on the car, and it is connected with the boiler in the ordinary way. We are told that it is possible with this boiler to obtain 180 lbs. of steam, from cold, in three minutes.

The main burner receives its supply of petrol through a vaporiser, which is at all times kept hot by a pilot flame. The vaporiser consists of a small helical coil of piping which is placed vertically above the pilot light. The size of the pilot light can be varied by a needle valve, and the heat given by it is sufficient to also maintain a normal pressure of steam in the boiler, whilst the car is standing. The main petrol feed is automatically controlled by a diaphragm valve, but it can be cut off entirely by hand from the seat. The petrol is fed under air pressure from the supply tank, and an air tank is fitted in connection with it. The pressure is maintained by the pump driven by the engine, and it is automatically kept at a constant degree by a relief valve. The supply of water to the boiler is normally maintained by the mechanically driven pump on the engine, and the quantity which it delivers to the boiler is controlled by a hand-regulated bypass from the seat. The surplus water flows back into the feed-water-heater.

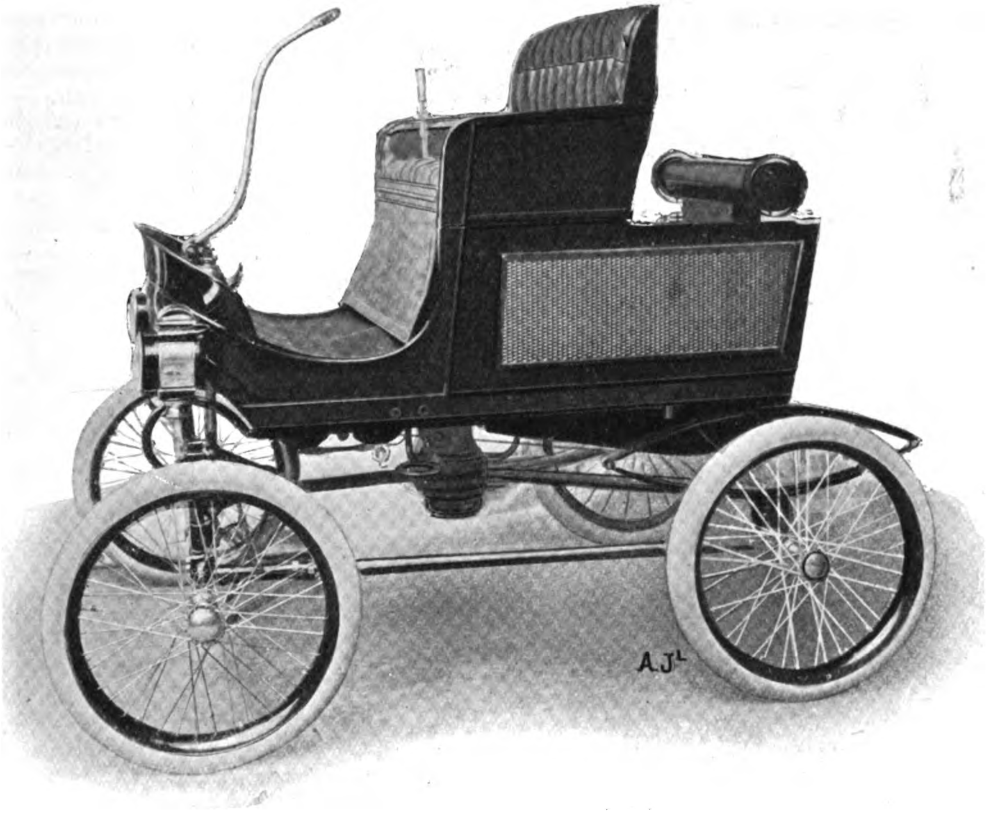


FIG. 1.—The Toledo Steam Car.

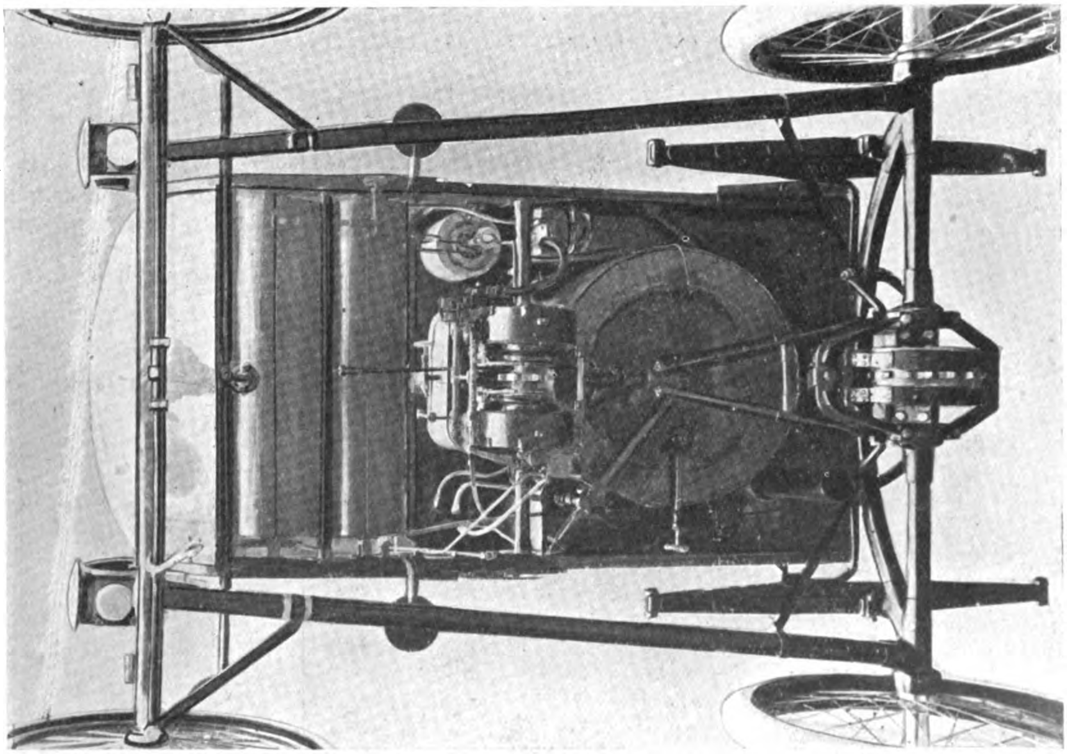


FIG. 2.—The Toledo Car—View from Beneath.

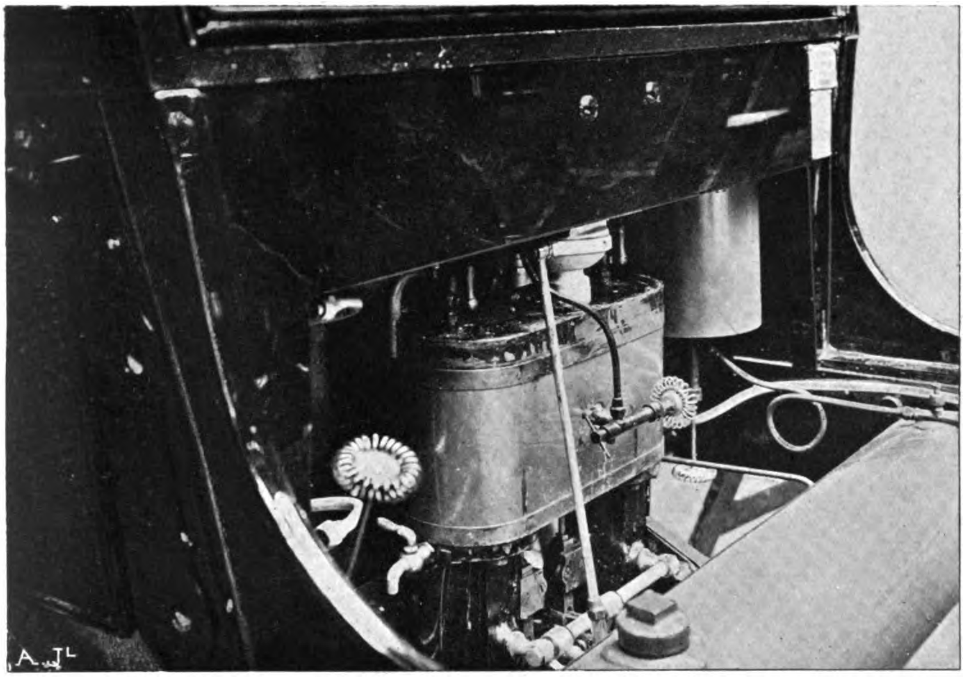


FIG. 3.—View of Toledo Engine from Right Side of Car.

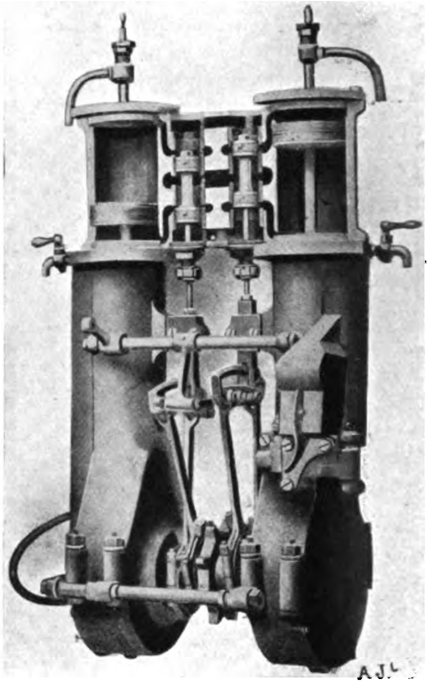


FIG. 5.—The Toledo Engine.

In the event of the mechanical feed failing to work, the driver can at any time force water into the boiler by means of a hand-pump, which forms a part of the steering-gear. This pump is clearly shown in Fig. 7. The curved lever passing up from it is the steering tiller. If the water in the boiler becomes too low, it is only necessary to give a few strokes up and down with the tiller.

The feed-water-heater is combined with an exhaust steam silencer, and is so placed above the boiler that it is not only heated by the exhaust steam, but also by the exhaust gases from the burner. The feed-water is drawn through this heater by the pumps, and its temperature is therefore raised to a considerable degree before it is delivered into the boiler.

The exhaust steam can either be taken through the silencer, or can be allowed to pass to a condenser fitted beneath the car in front. The condenser is of the torpedo pattern, which is already well known to our readers.

A single hand lever, only, is fitted on the Toledo cars for operating the throttle valve, and for controlling the reversing gear. It is placed to the side of the seat, near

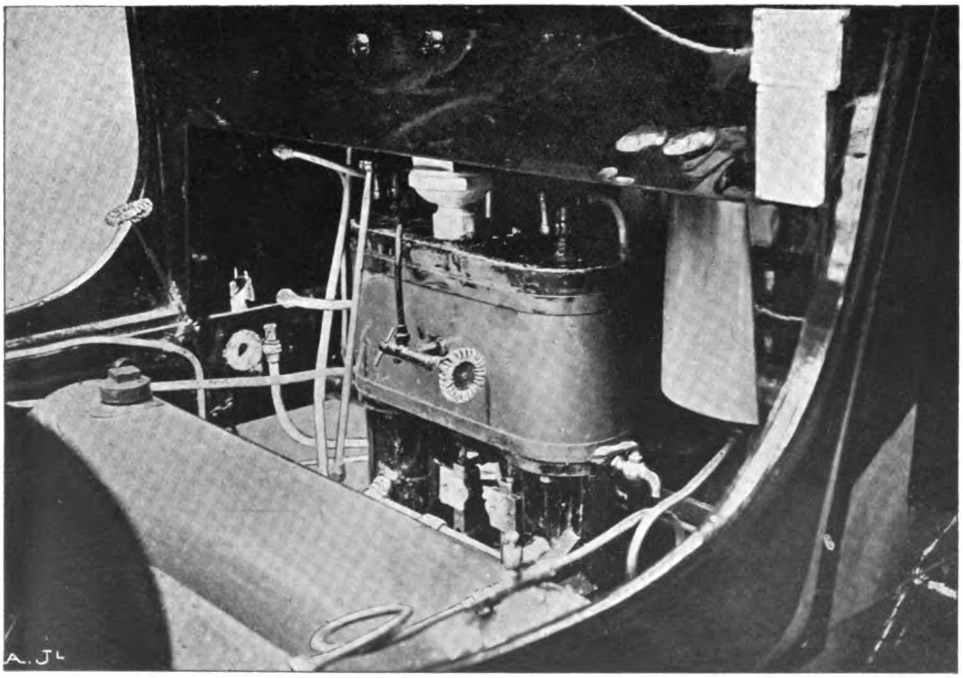


FIG. 4.—View of Toledo Engine from Left Side of Car.

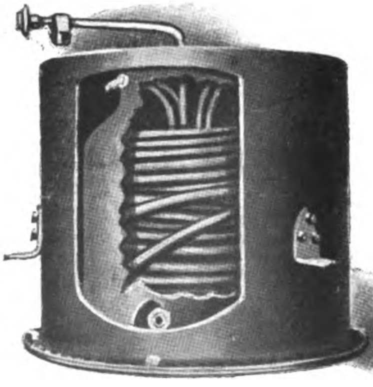


FIG. 6.—The Toledo Boiler.

the driver's right hand, and is so connected with the reversing gear that when moved forward the valves are set for going "ahead" before the throttle valve is opened. Further movement forward acts upon the throttle valve, gradually admitting more steam to the engine. When the lever is in its neutral position the throttle valve is closed, and the reversing gear is at "mid-link." When moved backwards the engine is reversed before steam is admitted to it.

The steering gear is of much the usual pattern so far as the connection between the two front wheels is concerned. The vertical shaft, which is turned about its axis by the tiller, is, however, conected with those parts of the gear which are carried by the front axle through a flexible connection in which a spring is introduced for permitting any relative movements of the body and the underframe to take place without allowing back-lash of the steering to occur.

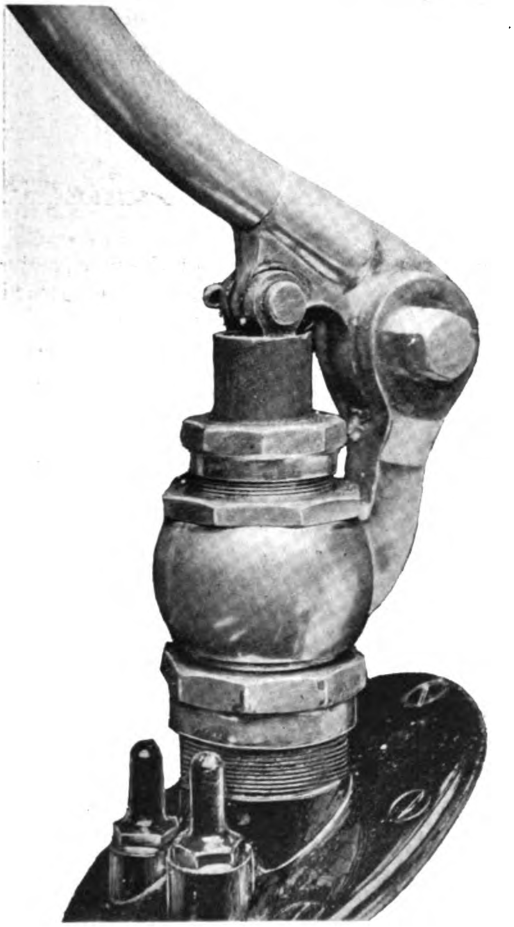


FIG. 7.—The Toledo Combined Hand Pump and Steering Tiller.

These cars appear to be well built, the boilers seem to be able to provide ample steam for all requirements, and the various provisions made should render them popular with the public.

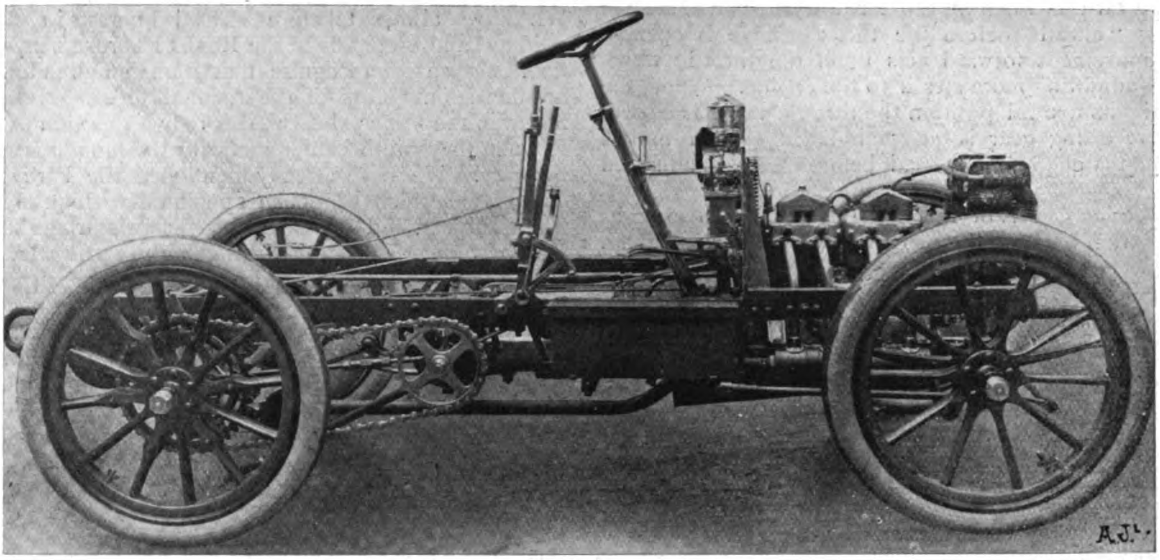
The bodies are nicely finished and upholstered; they are fitted with steel panels and have steel fronts. The Victoria Carriage Works, Limited, of Long Acre, who have taken up the agency in this country, are showing Toledo steam cars both at the Stanley Exhibition, now being held, and at the Crystal Palace Show which opens next week.

ROADS IMPROVEMENT.

WE have always taken a special interest in the proceedings and proposals of the Roads Improvement Association, because we recognise that though automobiles may not be the only users of the road at present, and perhaps not even the principal users, it is only a question of time as to when they will become practically the monopolists of the highway. We have already mentioned the Parliamentary Committee which has been appointed to inquire into the whole subject, and we have now received from the Roads Improvement Association a valuable little pamphlet dealing with the whole question and particularly those aspects of it which require accentuation before the Committee. A large proportion of these proposals deal with the reorganisation of highway administration. And, apropos of this, a very sensible proposal is put forward, suggesting the codification or consolidation of the Highway Acts. As regards what the public may do on highways, existing Acts, except as refer to London, are fairly explicit, though, as we have had occasion to point out from time to time, the decisions of judges have muddled matters up considerably. But, as regards the administration and the responsibility for their maintenance, the existing muddle is simply preposterous, and the consolidation suggested would need to involve a large measure of reform to be of much real value. One of the most ridiculous survivals of mediæval manorial rights—of which, by the way, petty sessional magistrates are another—are the rights exercised and responsibility reposed in lords of the manor in many districts for the repair of bridges. If a bridge is injured the lord of the manor is bound to repair it; but he is not apparently bound to do so within a definite period of time, and he may recoup himself by marking down trees on the estates of any of his copyholders on the manor. This kind of absurdity requires abolition altogether, and we trust the R.I.A. will not neglect impressing the importance of such a reform on the Committee. The pamphlet in general recommends the centralisation of controlling authority in the administration of highways, and the actual execution of the necessary work by the local authorities. We have already expressed our approval of this suggestion, but the pamphlet lays stress on a point which has so far escaped general recognition, and that is the importance which the automobile is gradually conferring upon the roads of the country for strategic purposes and assistance in the national defences. Hitherto in every European country the national defences have been organised on a railway basis, the carrying capacity of roads for military purposes being relatively insignificant. The automobile is changing all that. In the future a country's roads will be only less important, if less important, for purposes of defence than the railways, and from this point of view the proposals of the Roads Improvement Association acquire a really national importance.

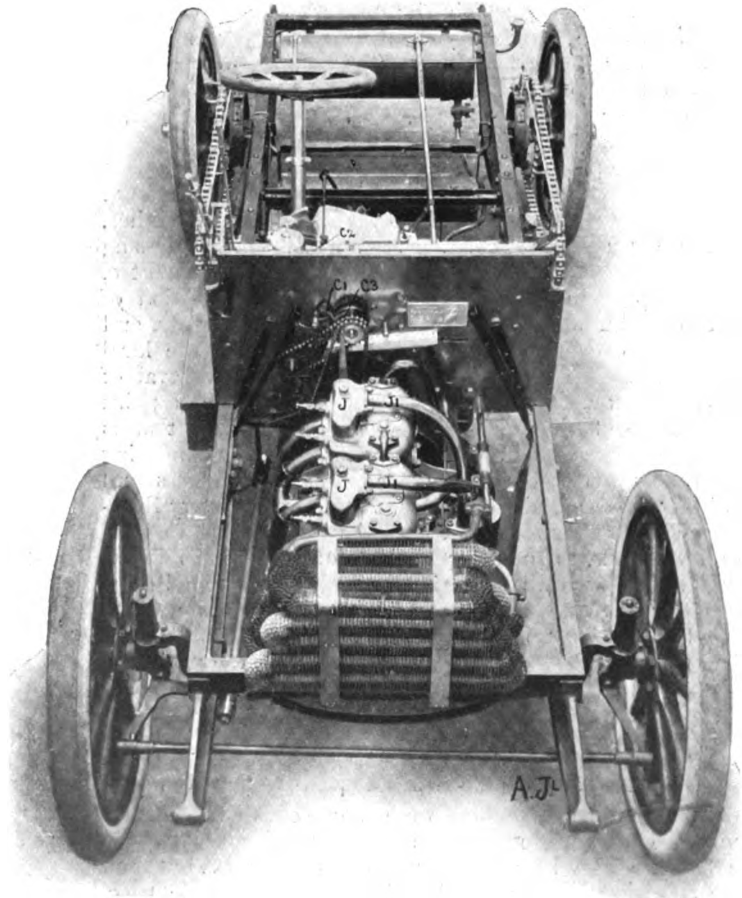
As a result of the advertisements inserted by the Eastbourne Town Council for the provision of public motor omnibuses, sixteen tenders were received from different firms. The sub-committee appointed to go into the tenders are carefully considering the whole scheme, but their decision will probably not be given for some little time. The question is a large one for Eastbourne, as it is a case of motor omnibuses *versus* tramcars, and it is felt that one or the other is a necessity. Popular opinion appears to favour motor omnibuses.

THE NEW 12-h.p. NAPIER CAR.



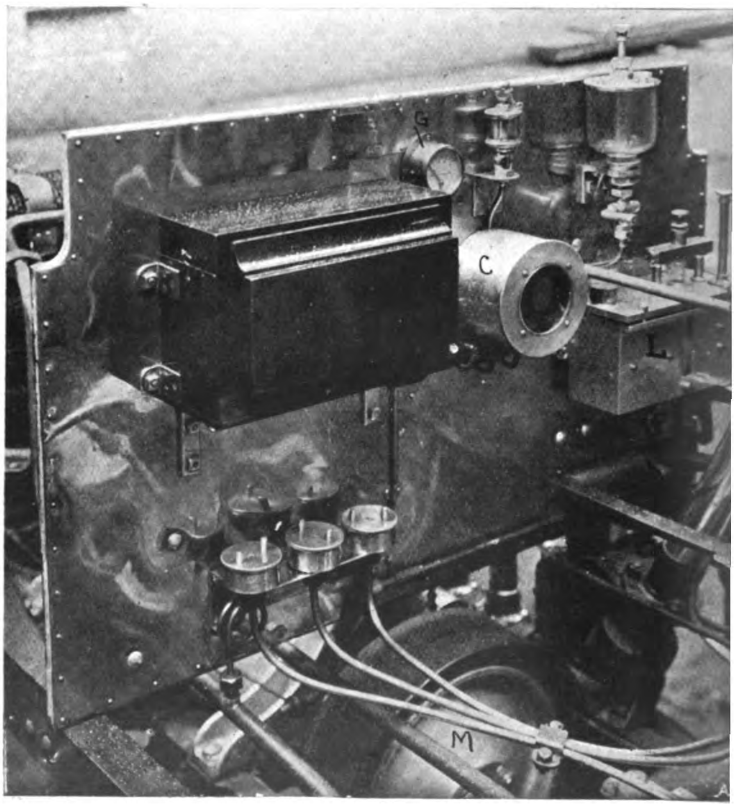
The Napier 12-h.p. Chassis—Side View.

THE accompanying illustrations of the new Napier model show many of the interesting details of construction, and are well calculated to demonstrate the absence of complication which is so striking a feature of the design. We gave a full description of the car on December 13th, page 846.



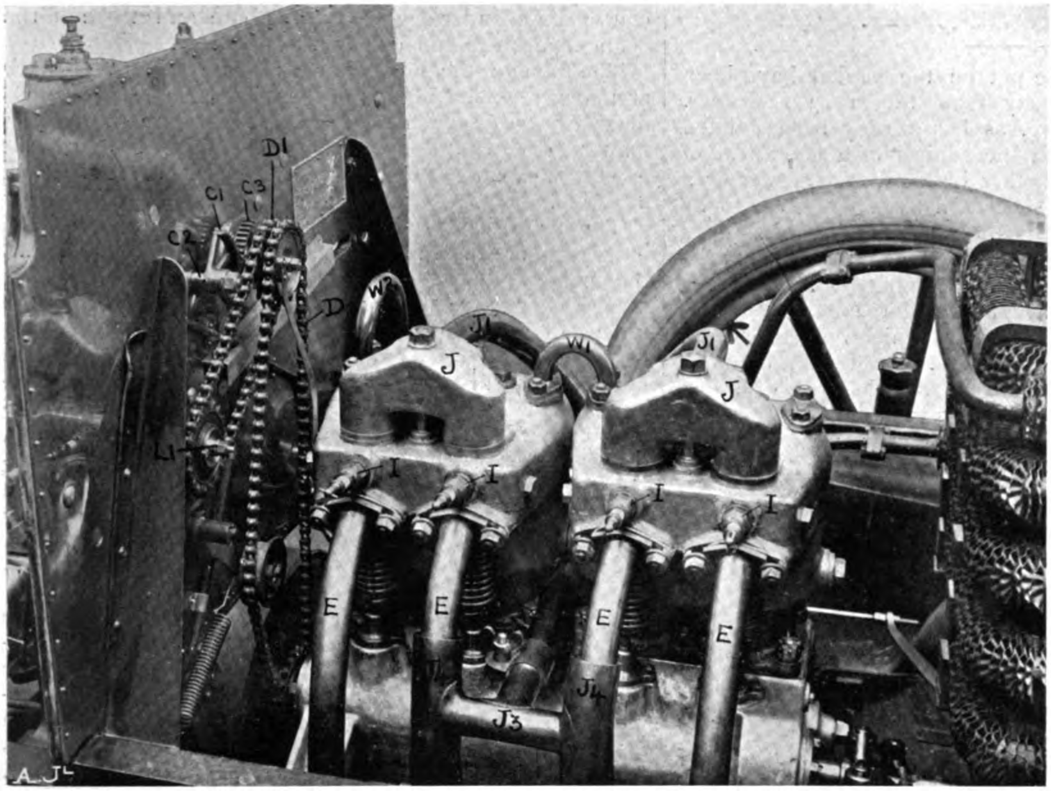
View of Napier Chassis from above and in front.

C^1. Toothed Quadrant on Timing Rod. C^2. Timing rod. C^3. Quadrant on Commutator. J. Pipe fittings holding down Inlet Valves. J^1. Induction Pipes from Carburettor.



View behind Dashboard—Napier Chassis.

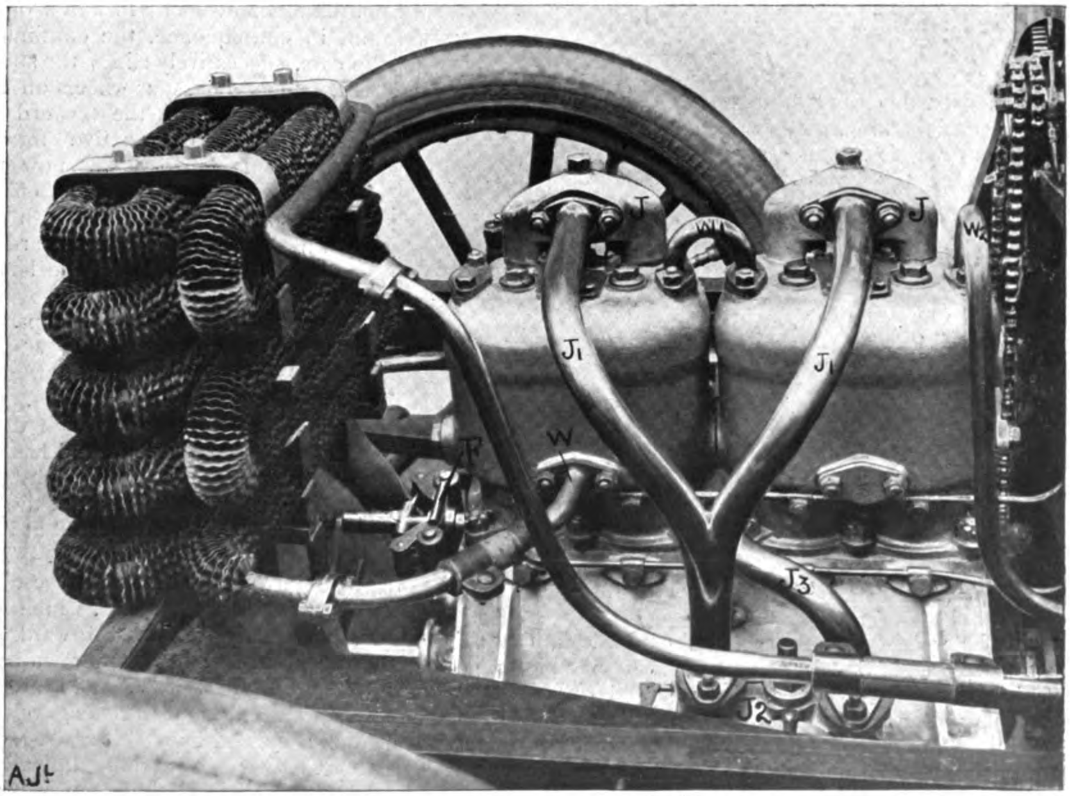
C. Commutator. C^2. Timing Rod. G. Water circulation Gauge. L. Lubricator. M. Main Clutch. P. Clutch Pedal. P^1. Brake Pedal. S. Steering Pillar.



C^1. Toothed Quadrant on Timing Rod. C^2. Timing Rod. C^3. Quadrant on Commutator. D. Chain-driving Commutator on Dash. D^1. Chain driving Lubricator on Dash. E. Exhaust Pipes. I. Ignition Plugs, J. Pipe Fittings, holding down Inlet Valves. J^1. Induction Pipes from Carburettor. J^3. Warm Air Pipe to Carburettor. J^4. Air Pipe Sockets encircling Exhaust Pipes. L^1. Lubricator spindle. W^1. Water Pipe connection between Jackets. W^2. Water Pipe from top of Rear Jacket.

View beneath Bonnet from right side of Car.

F. Centrifugal Governor. J. Pipe Fittings holding down Inlet Valves. J^1. Induction Pipes to Carburettor. J^2. Carburettor. J^3. Warm-air Pipe from Carburettor. W. Water Pipe from Radiator to bottom of Front Jacket. W^1. Water Pipe connections Jacket. W^2. Water Pipe from top of Rear Jacket.



View beneath Bonnet from Left Side.

THE 1903 MERCEDES.

Few vehicles about to be put on the market have been awaited with more curiosity than the 1903 Mercedes. The previous models have, as has already been pointed out in our columns, been the subject of a good deal of imitation on the part of other builders, to a greater or a smaller extent. It is of special interest, therefore, to be able to note as early as possible the leading alterations in structural design which are being adopted by the celebrated firm in their models for the coming year.

We understand that at present the intention of the Company is to standardize their vehicles in two sizes, which, except for differences in detail, measurement of frame, engine, and transmission, are to be identical with one another. The smaller of these cars will develop from 18 to 25-h.p., and when equipped as an ordinary touring car will weigh from 750 to 800 kilogs., though when stripped for racing its weight does not exceed 650 kilogs., that of the complete chassis without body being only 610 kilogs. This vehicle is apparently capable of a speed of 70 kiloms. on the flat, and is said to be an exceptionally good hill climber.

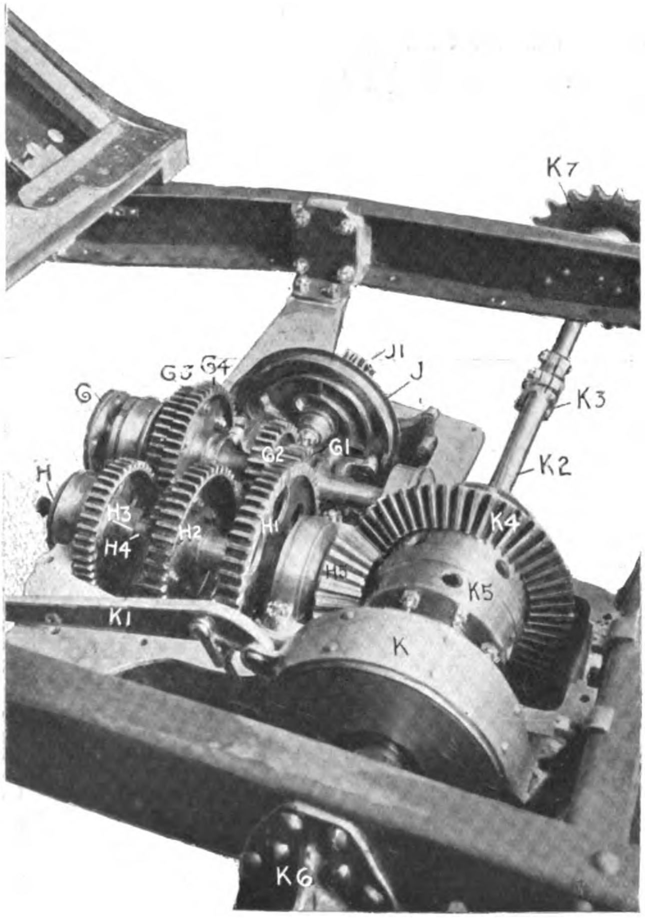


Fig. 1.—The 1903 Mercedes Change-speed Gear.

The 60-h.p. type has not yet been completed, so that we are unable to give its weight or actual speed, though it is estimated that it will be capable when suitably geared of exceeding 100 kiloms. per hour on the level. It has, of course, a 4-cylinder engine, and the bore and stroke of the cylinders are 140 and 150 mm. respectively.

The frame of the new vehicle is stamped out of steel, and considerable alteration has been made in various details, but as several of these features form the subject matter of patents for which the Company is at present applying, exhaustive details regarding them are not yet available.

The main features in which improvements have been introduced are the change-speed gear, the main clutch and the engine.

The change-speed gear (Fig. 1), which is fixed to the main frame, has undergone important modification as compared with previous models. In general arrangement it consists of a first-motion-shaft which is fixed to the main-clutch-shaft by the flange-coupling, G, and of a second-motion-shaft, H, in the same horizontal plane with it, driving by bevel gear, H^5, K^4, the periphery of the differential, K^5. The countershaft, K^2, which carries the chain wheels, K^7, driving the rear wheels of the vehicle, is provided with a coupling, K^3, and is carried in outside bearings, K^6, rivetted to the main frame. The four spur-wheels, H^1, H^2, H^3, and H^4, on the second-motion-shaft are rigid with it, and the changes of speed are effected by sliding the corresponding wheels, G^1, G^2, G^3, and G^4, on the first-motion-shaft into mesh with them, alternatively, giving the 1st, 2nd, 3rd, and 4th speeds, respectively. These movements are effected by a specially shaped disk-cam, J, which is revolved by a spur-wheel, J^1, integral with it which meshes with a toothed segment operated by the change-speed lever. Two levers, engaging with each of the sleeves carrying either pair of spur wheels on the first-motion-shaft, engage in the convolutions of the cam, these latter being so shaped that a continuous movement forwards of the change-speed lever, and, in consequence, the continuous rotary movement of the cam, successively slides the spur wheels into mesh with the corresponding spur wheels on the second-motion-shaft. The result is that all the forward speeds are obtained by continuous and consecutive forward movements of the change-speed lever as is now usual in the majority of other cars. Reversing is effected by an extra spur wheel being brought into mesh between the low-speed spur wheels by an extreme rearward movement of the speed-lever. This intermediate wheel is also controlled by the cam, J.

The main clutch is of the expanding type, and its construction is very simple. In Fig. 2 it is seen complete inside the combined fan and flywheel, the boss, E, of which forms its outer member. Fig. 3 shows the expanding portion, F^3, and the parts which operate it. The flywheel is fixed to the crank-shaft, and has its spokes, E^1, shaped as fan-blades; the bulk of its weight is provided in the rim, E^2. The inner member, F^6, of the clutch is mounted upon a shaft, F^1, which is connected at its other end to the first-motion-shaft by the flange, F. The shaft, F^1, has spiral projections, F^5, upon it, and these fit corresponding spiral grooves inside a sleeve, F^7, which fits over it. The sleeve, F^7, is normally held in a forward position by the helical spring, F^2, and can be withdrawn by a fork engaging in the groove, F^8. It is provided with teeth, F^9, forming a sector at its front end, and these engage in a similar quadrant, F^4, which is carried by a bell-crank-lever as seen. When the sleeve, F^7, is moved longitudinally on the shaft, F^1, the spiral path between them causes it to rotate about the shaft, and the teeth, F^9, then make the bell-crank-lever rock

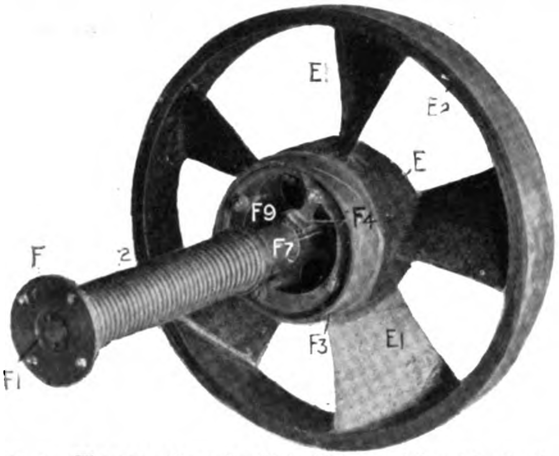


Fig. 2.—The 1903 Mercedes Main Clutch and Fan-Flywheel.

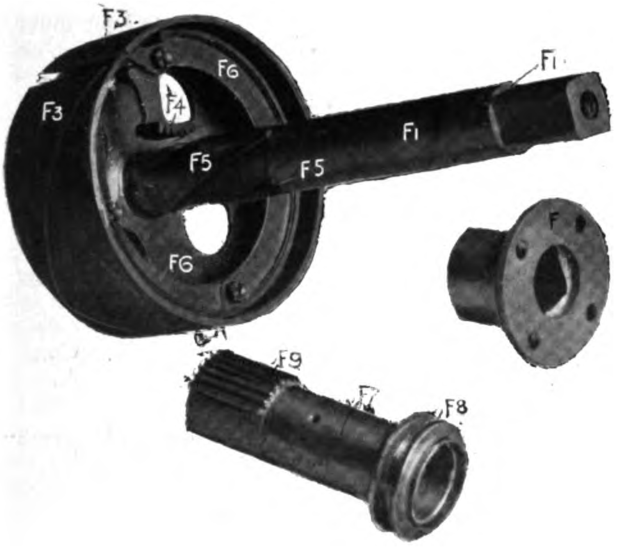


Fig. 3.—Details of the Main Clutch.

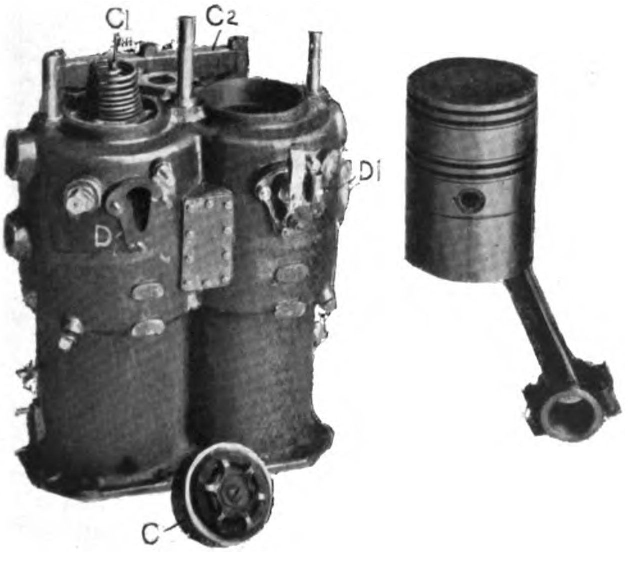


Fig. 4.—The 1903 Mercedes—a pair of cylinders, showing inlet valves, and the piston with connecting-rod.

about its pivot. The bell-crank-lever expands the ring, F^3, or allows it to contract.

Fig. 4 gives a view of one pair of cylinders of the engine. The most noticeable feature is that the inlet valves, which are of very large size, are arranged centrally in the cylinder heads, one of them, C^1, is seen in place though it is exposed to view, and the other, C, is completely removed, and is displayed in an inclined position against the casting. They are not, as might be supposed, atmospheric valves, but are actuated positively as heretofore, though, owing to their different position, certain changes in the mechanical arrangements for doing this have been introduced. One advantage of this arrangement is that it gives increased space for the application of the two forms of ignition employed in the new engine. The exhaust valves are apparently arranged as usual, and are beneath the yoke, C^2. The piston and connecting rod are shown on the right of the figure, and it will be seen that four piston rings are fitted.

The new engines employ two forms of ignition. One is the old magneto, and the other the new Mercedes ignition, in regard to which, mainly for the reasons we have above specified, considerable secrecy is maintained. We are, however, informed that ignition plugs and a magnet are made use of, but no induction or intensity coil is employed.

The axles in the 1903 cars is of T section instead of being round as in last year's vehicles, and the rear wheel brakes, which are exceptionally powerful and noiseless, are actuated by wire ropes. These brakes are of the internal type.

Ball bearings are employed throughout the gear-box.

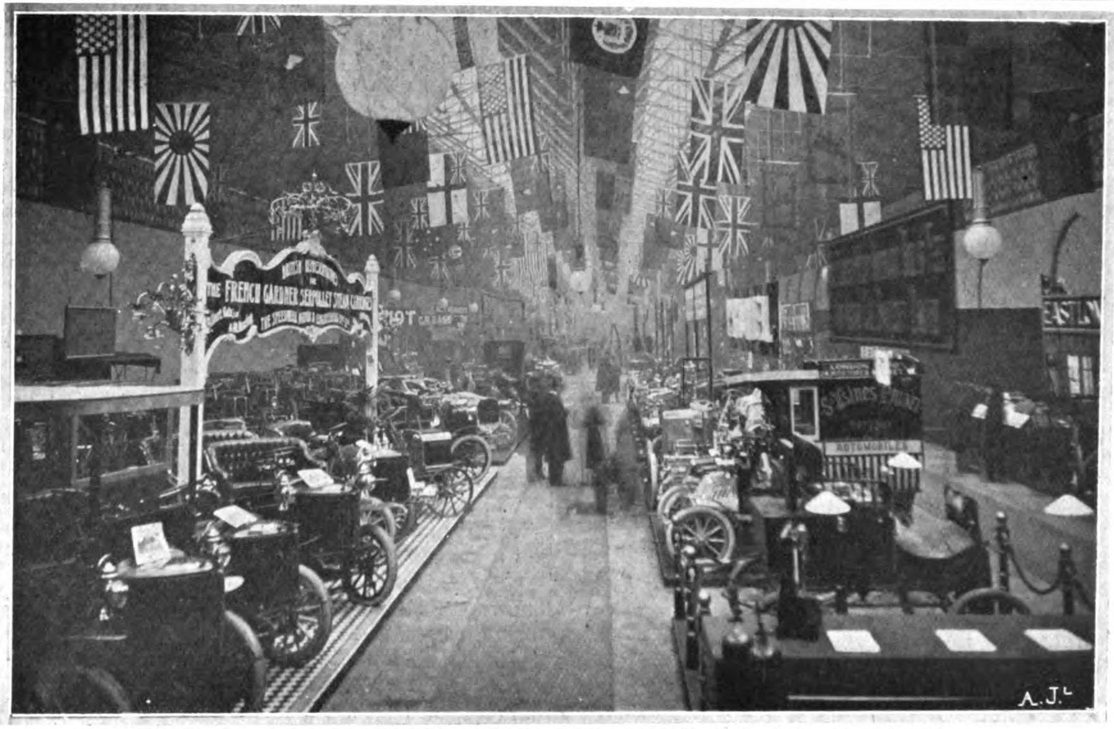
The radiators are of the honeycomb type, but are so constructed that the surface exposed to the air is considerably increased. The tubes are arranged much closer together, and something like 5,000 of them are employed. The space between the tubes is about $\frac{1}{4}$ mm.

The carburettor forms the subject matter for a patent, and but little data concerning it is available. It is, however, of smaller size than at present, and is fitted with a butterfly throttle-valve. It is said to permit of even lower engine speeds than before, and to render the engine still quieter. We learn, on the authority of our German contemporary, the *Allgemeine Automobil-Zeitung*, to whom we are indebted for the photographs, that the lift of the inlet-valves is variable.

In addition to these cars the Company are constructing a few 90-h.p. vehicles, in which the engine is mounted amidships, and the driver's seat is over the rear wheels; their weight does not exceed 1,000 kilogs.

* * *

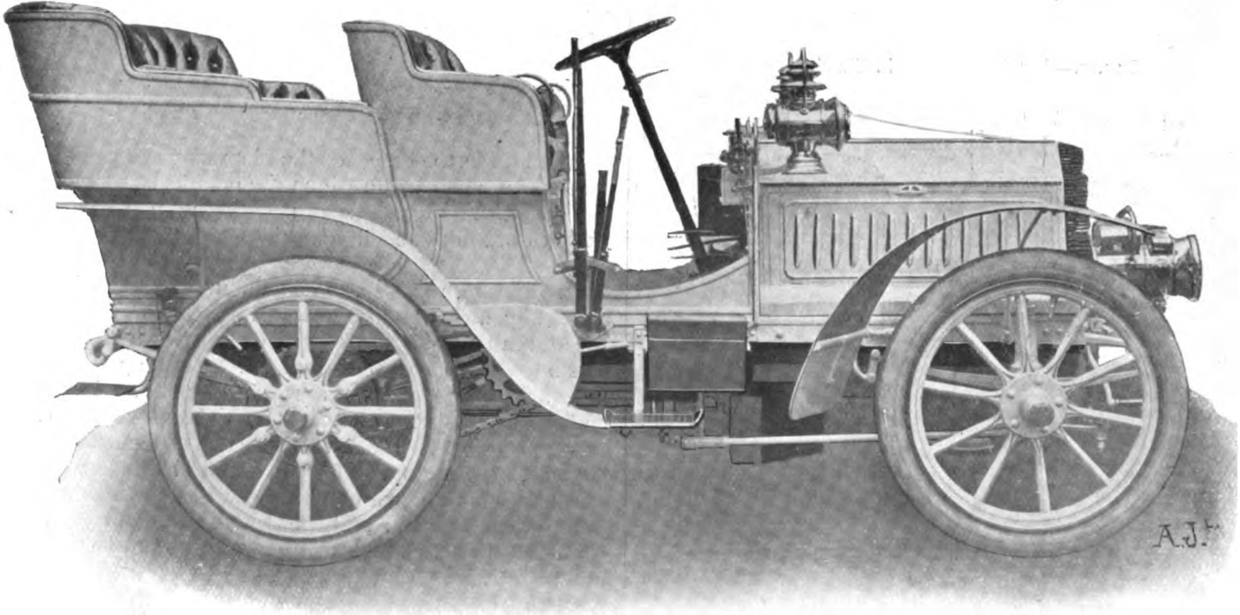
In Chicago, recently, the chauffeur of one John Farson, a wealthy automobilist, was arraigned for exceeding the speed limit, conviction being, of course, a foregone conclusion. The only chance for the defending attorney, who was also John Farson's regular legal adviser, was to endeavour to get the fine—ten dollars—remitted. For this purpose he pleaded with such eloquence extreme poverty, large family, and other doubtful blessings, on behalf of the miserable chauffeur, that many of those who listened were moved to tears, and the Judge decided to mulct the defendant in actual costs only. Consternation reigned in the Court, however, when the defendant immediately stepped forward briskly and tendered a 100-dollar bill wherewith to liquidate his indebtedness. In the expressive words of the local reporter, whilst the bill was being "busted" the attorney was glad to beat a retreat unobserved.



The Stanley Automobile Exhibition, Earl's Court.—General View of the Queen's Palace.

THE STANLEY AUTOMOBILE EXHIBITION.

THE first Automobile Exhibition organised by the Stanley Show Committee was opened at Earl's Court, by Sir Albert Rollit, on Thursday, the 15th January. A large number of invited guests and Pressmen were thus afforded an opportunity of inspecting the exhibits in advance, and the doors were thrown open to the public on the following day. Although by no means representative of the British automobile industry, yet the Ducal Hall and the Queen's Palace were well filled with interesting exhibits, and a considerable number of the most up-to-date vehicles were shown by various manufacturers or their agents. Considering the weather, the exhibition may be said to have been fairly well attended, but the climatic conditions which have prevailed recently have been by no means well calculated to attract the public. The buildings used at Earl's Court are hardly ideal for such a show; for although a considerable

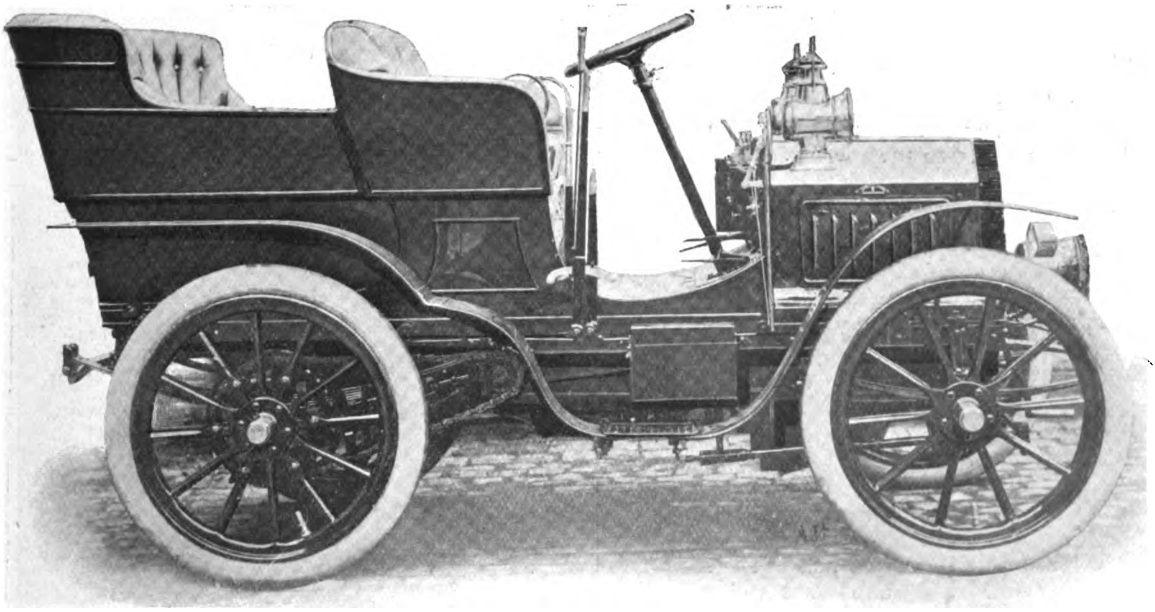


15-h.p. Germain Tonneau.

General View of the Ducal Hall.

amount of space is available, yet the separation of the two halls from one another is a distinct disadvantage, and the absence of any effective method of heating the buildings is highly detrimental at this time of the year. During the first day or two the temperature was almost Arctic, and the few stoves provided were totally inadequate.

The majority of cars shown have already been described in our columns, and not a few of those which we dealt with in connection with the recent Salon in Paris are again to be seen here. Of British-built cars, the Motor Manufacturing Company had a very fine exhibit of their well-known vehicles.* The London Motor Garage Company showed



7½-h.p. Germain Tonneau.

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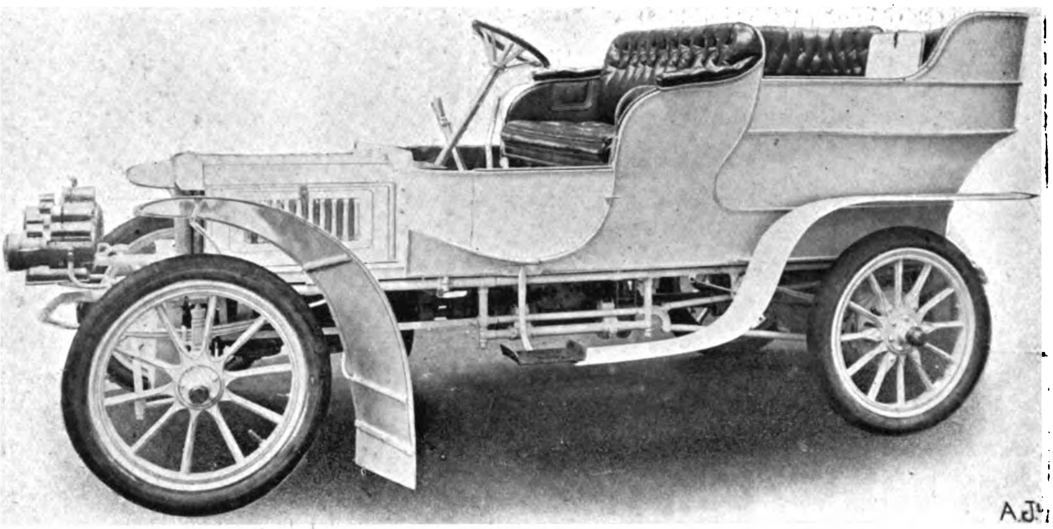
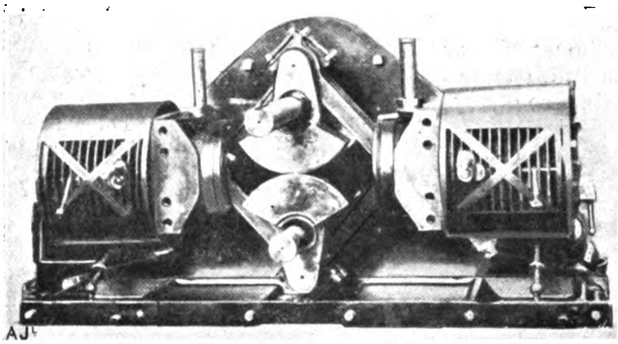
* Automotor Journal, pp. 622 to 625, Vol. VII.



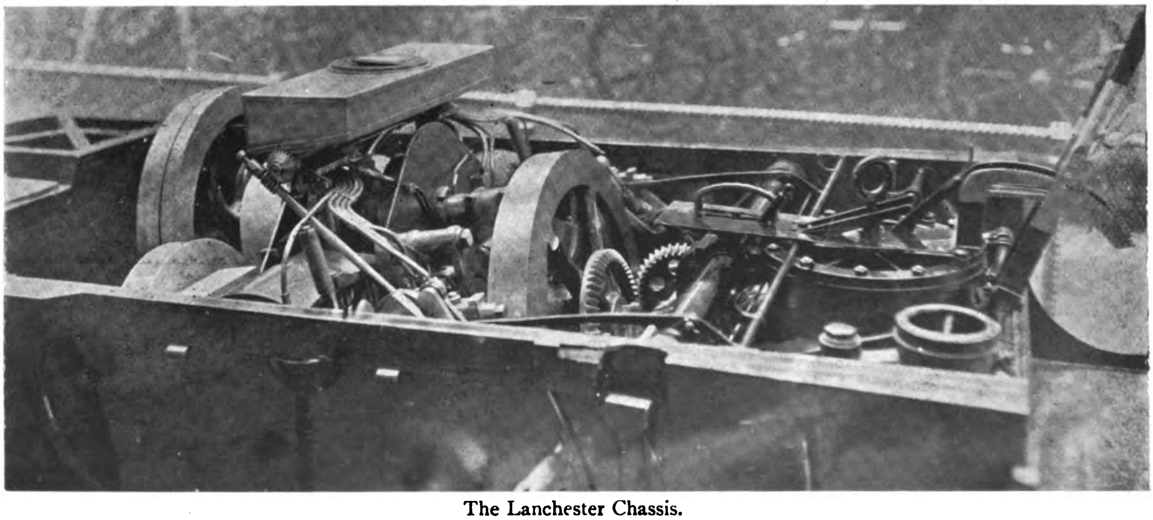
The Velox Petrol Car.

samples of their "Pipe" cars,* which we described recently, and a vehicle of somewhat similar construction, called the "Magnet." The Velox Company, of Coventry, had on their stall one of their new 12-h.p. chassis, of which we completed our description last week, and also a completed car painted white and upholstered in red morocco, of very handsome appearance. Another all British vehicle which was uncommonly well represented, and which is constructed on original lines throughout, is the Lanchester.

The Lanchester Company showed a chassis on their stall, and thus exhibited the details of construction of their cars to the public for the first time. Pressure of space prevents our dealing with the machine very fully here, but we give some few illustrations showing various parts of it. From the two illustrations of the engine it will be seen that two facing cylinders are employed, and that the pistons of each are connected to two cranks on parallel crankshafts which revolve in opposite directions. A very thorough balancing of parts is secured, the explosions occurring behind the two pistons simultaneously, and the thrusts imposed by the connecting-rods being opposed to one another. The two crankshafts are connected together by gearing, and the power is taken to a longitudinal shaft beneath the engine through gear-wheels having helical teeth. The change-speed gear is of the epicyclic pattern, and by it is obtained the two lower forward speeds, and the reverse. On the top speed the clutch cone, B, in our illustration, is brought into engage-



The Lanchester Engine, showing Cranks and Connecting-Rods.



The Lanchester Chassis.

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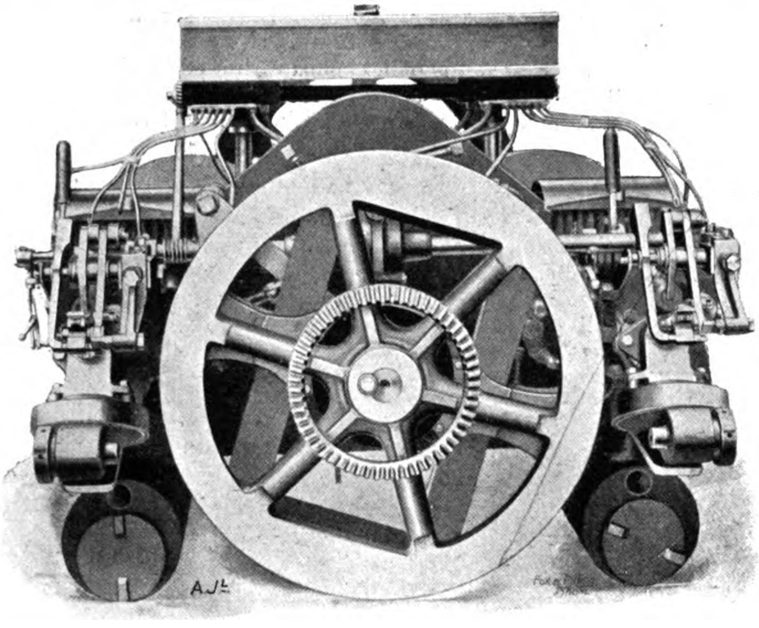
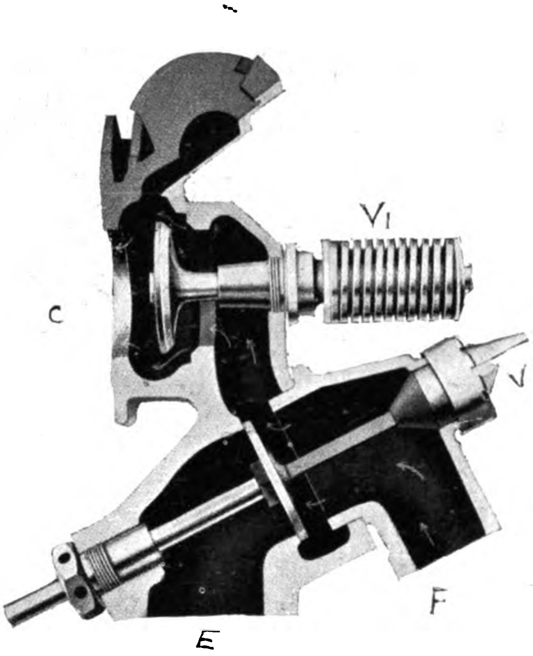
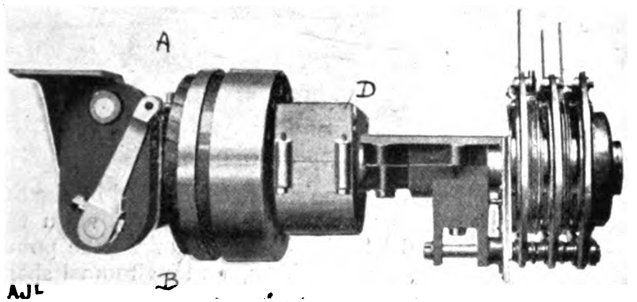
* AUTOMOTOR JOURNAL, pages 864 to 869, Vol. VII.]



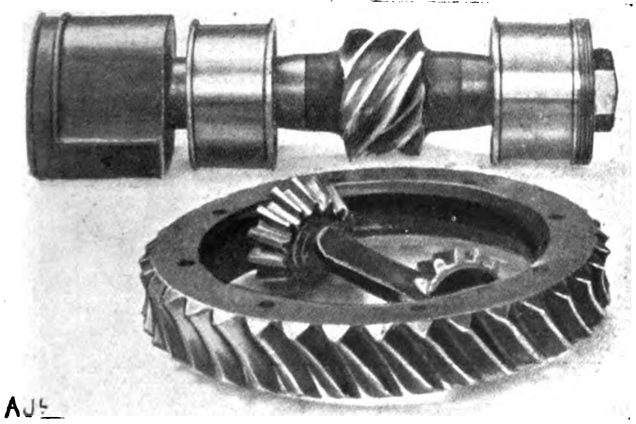
Front View of Lanchester Engine.



The Lanchester Engine Valves.

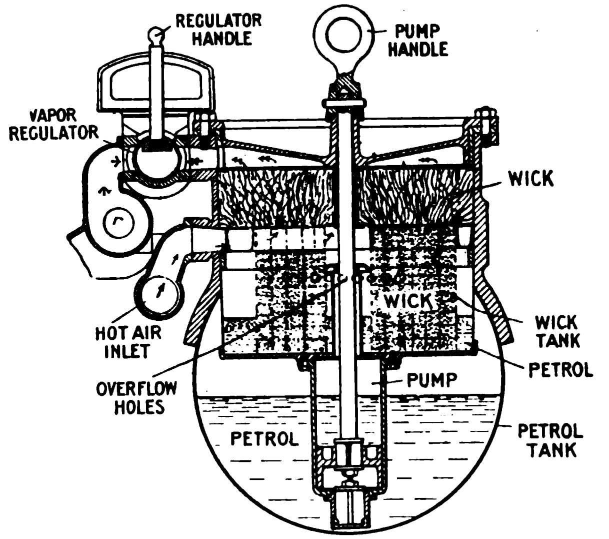


The Lanchester Change-Speed Gear.



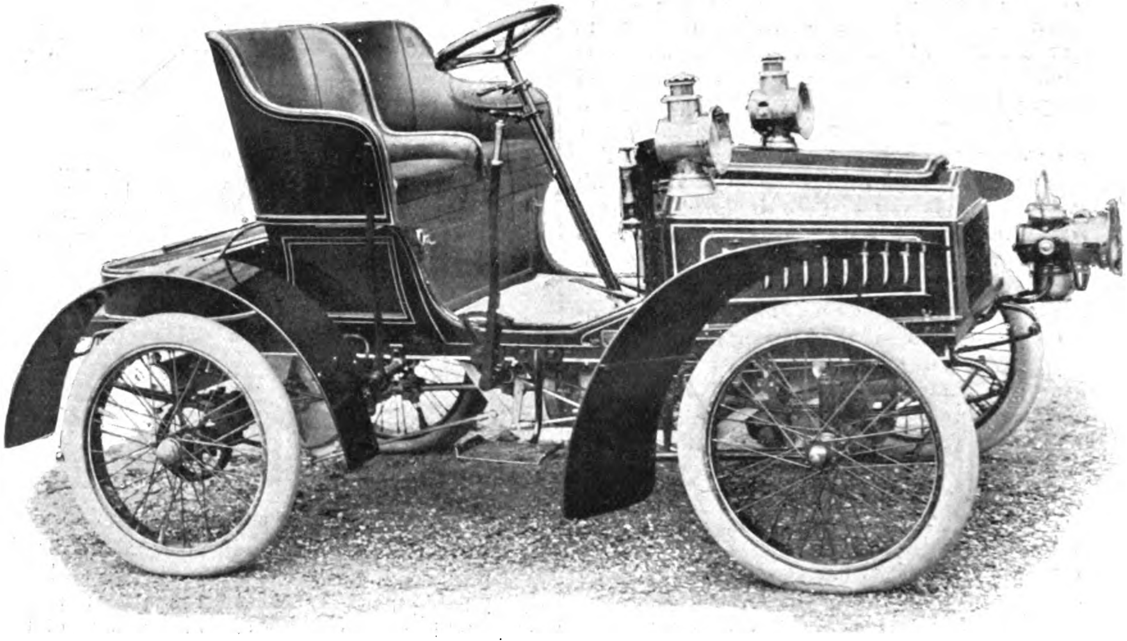
The Lanchester Worm Gear—about Differential.

ment with the clutch shell to the right of it, and under these conditions the epicyclic gearing revolves as one piece. When the clutch, B, is withdrawn to a still further position forward, it comes into contact with a stationary brake-cone, and gives a powerful retarding action to the car. The main clutch and this brake are operated by a single lever through the crank, A, in the drawing. The gear-wheel which drives the gear-shaft is inside the casing marked D. The power is transmitted to a live-rear-axle through a worm of special form on the shaft, a similar and larger worm wheel being fixed to the differential gear about the back axle. This worm wheel, as also the planets of the differential, are seen in another drawing. The arrangement of the inlet and exhaust valves on the engine is unusual. They are seen sectionally in one of our illustrations, where C is the port leading to the combustion chamber, E is the exhaust passage, and F is the induction pipe. A main valve, V^1, which is mechanically operated, controls the passage between the combustion chamber and a two-way valve, V. This second valve, V, is also operated by a cam, and alternately places the inlet and exhaust passages in communication with the main body of the valve. The carburettor, which is shown sectionally, is of the wick type, and is provided with a hand pump, by which the petrol can occasionally be drawn up from the supply tank at its base to saturate the



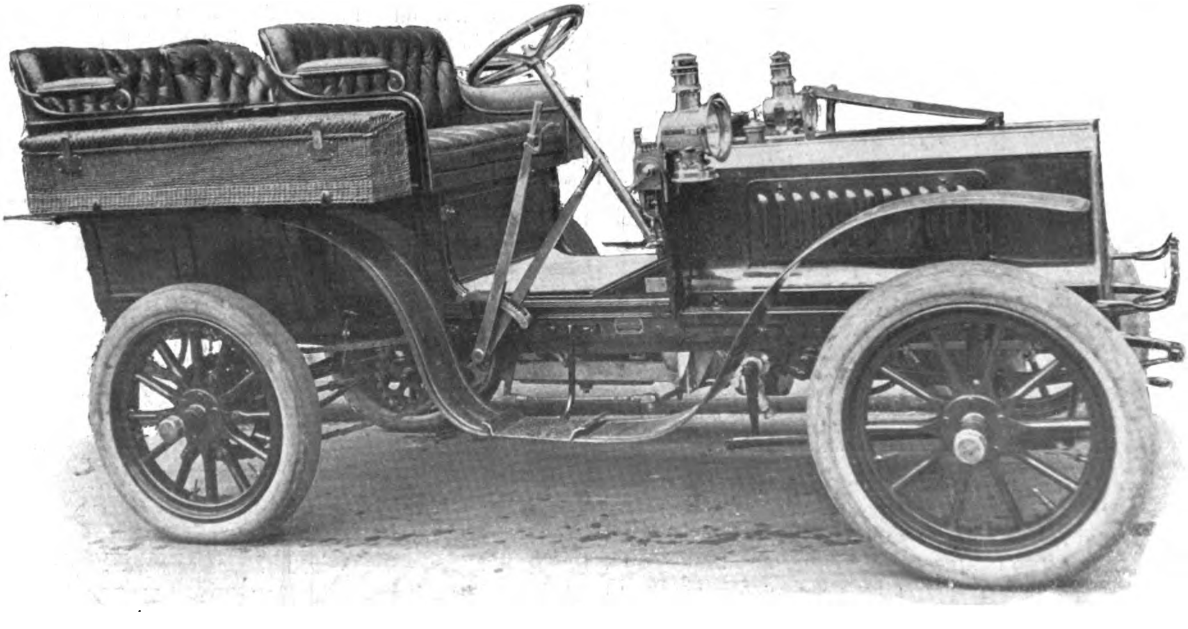
The Lanchester Carburettor.

wicks. The manner in which it works is self explanatory. Another interesting feature of the engine is in connection with the ignition system. The current is generated as required by permanent magnets, which are fixed to the fly-wheel, and which, in combination with a stationary coil, generate the current. The igniters are of the low tension type, and a special feature of them is that the circuit is completed both inside the cylinder and outside, prior to the break occurring. The two sets of contacts are arranged in parallel, and the external circuit is broken slightly before the internal circuit. The object of this arrangement is to ensure a good contact being made prior to the break.



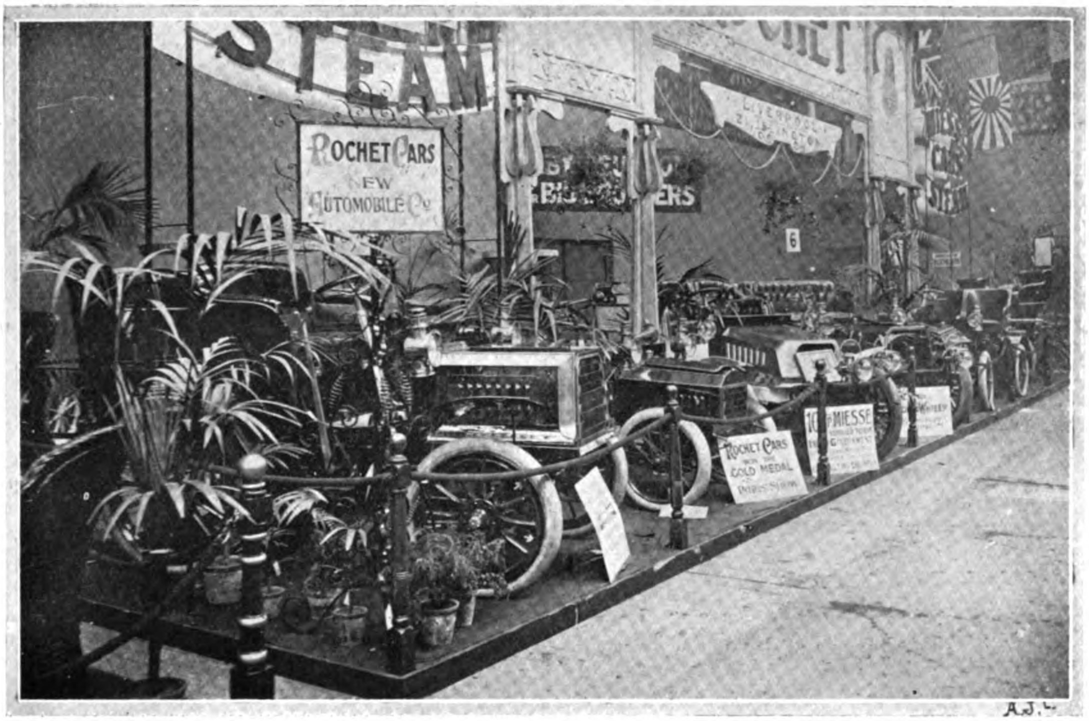
The 6½-h.p. Rochet Car.—New Automobile Company.

The New Automobile Company showed the three new 1903 Rochet models. The makers have abandoned their tubular frame and previous type of gearing. They have now adopted a gear in which a direct-through drive is obtained on the top speed, and in which the lay-shaft remains at rest when the top speed is employed In the 6½-h.p. voiturette, the power is transmitted to a live-rear-axle through a longitudinal shaft, and in the 10 and 16-h.p. cars side chains are employed.

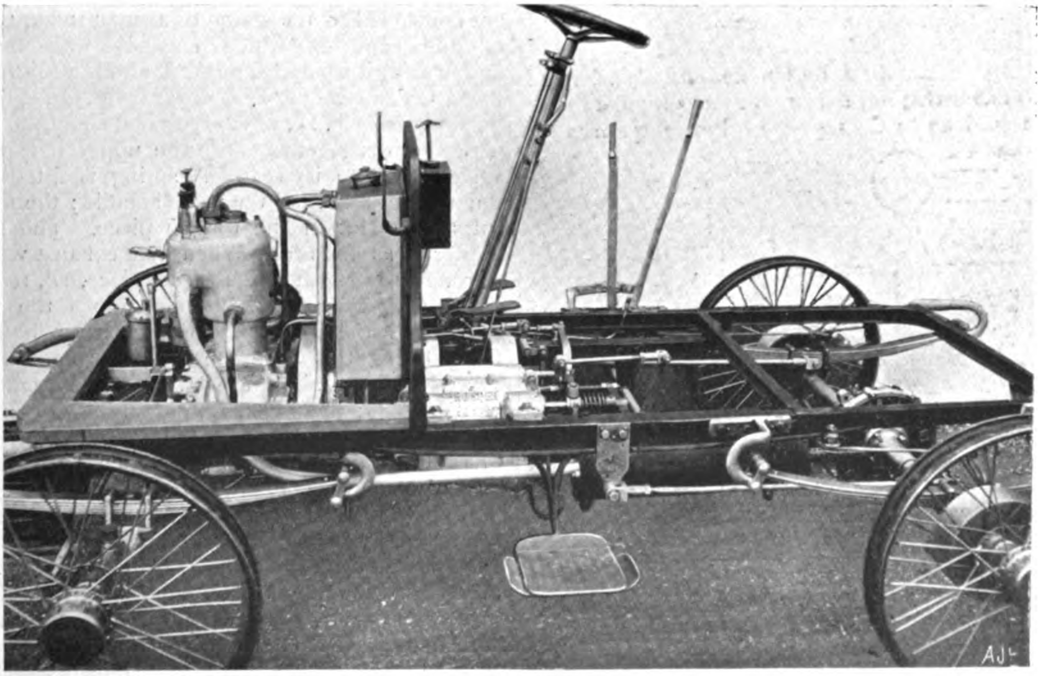


The 16-h.p. Rochet Car.—New Automobile Company.

The British Germain Company not only showed the latest Germain models, but also a "Staughton" voiturette and a chassis of the same build. These latter were shown in Paris on the Prosper Lambert stall. Our frontispiece last week represented one of the 15-h.p. Germain vehicles, and our present illustrations depict a similar vehicle fitted with a tonneau body, as also a 7½-h.p. tonneau. The "Staughton" car has been described elsewhere, and the arrangement of its mechanism can be followed from our photograph of it. We understand that the Company are

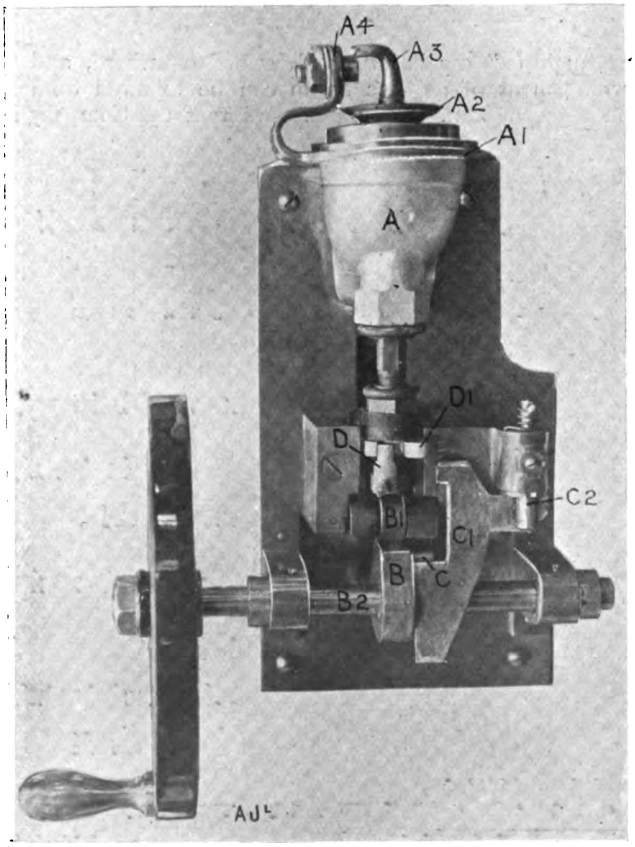


The New Automobile Company's Stand.—Stanley Exhibition.



The British Germain Company's 8-h.p. "Staughton" Chassis.

The Duryea Brougham.



The Duryea Combined Exhaust-Valve and Igniter.

introducing a new type of carburettor for their larger cars, and that it will be on view at Earl's Court before the Exhibition closes; we are compelled, however, to hold over any description of it.

Other firms who showed well-known petrol cars were the Motor Traction Company, who made a special feature of the "Salisbury" car, and were expecting the arrival of their new "Lambeth" vehicle, the Motor Car Company with the Decauville, and the British Automobile Commercial Syndicate, who had the 2-cylinder and 4-cylinder Clement 1903 chassis which were in Paris.*

The Duryea Company had an attractive stall, including three new models of their special type of vehicle. The most noticeable of the new models is the closed brougham, of which we reproduce an illustration. It is a compact looking little machine, and looks suited for use in the worst weather. Considerable interest was taken in a working model showing the combined exhaust-valve and low-tension-igniter which is employed on the Duryea engines, and which we have already referred to. Our illustration shows this mechanism. The casting, A, forms the valve seat and contains the valve, A^2, with its spindle. It screws into the cylinder casting, which is so shaped that a joint is also made between it and the casting for the exhaust gases to pass from it to the port in the main casting, which leads to the exhaust pipe. This latter joint on the removable part, A, is circular, but neither it nor the port in it can be seen in our illustration, as they are on the underside. It will be understood, however, that it is essential that a tight joint should be made at A^1 between the valve casting and the combustion chamber simultaneously with the exhaust gas joint being made. This is ensured by fitting washers of the required thickness in the joint, A^1, The exhaust valve, A^2, is operated by a cam, B, through the roller, B^1, in the usual way, but its spindle is provided with a small projecting block, D, by which it can be given a rotary motion, and so bring the contact piece, A^3, against the insulated and stationary plug, A^4. The ignition points are controlled by the action of a small roller, C, on the side of the cam, B, which engages with the plate, C^1, and causes it to move upward about a fulcrum, C^2. The plate, C^1, is normally held down by a spring, and a projecting tongue piece, D^1, which is carried about the valve spindle, comes into engagement with the upper part of it when the valve, A^2, is on its seat. A spring is fitted between the tongue piece, D^1, and the valve spindle; the fixed block, D, rides in a slot in the tongue piece. The action of the igniter is as follows:—When the exhaust valve is allowed to return to its seat, the tongue piece, D^1, rests above the plate, C^1. The cam, rotating, brings the roller, C, up underneath the plate, thus tipping it up about its fulcrum, C^2. During this time the tongue piece, D^1, is also being caused to move about the valve spindle against the action of its spring; the plate, C^1, continues to be raised to such an extent that it liberates the tongue piece after having lifted it to a certain position. When liberated it flies back and comes into contact with the block, D, causing the ignition points, A^3 and A^4, to suddenly separate and produce the necessary spark. It will be understood that the exhaust valve is raised by the cam, B, before the plate, C^1, has been allowed to resume its normal position, and that, therefore, the tongue piece, D^1, does not interfere with its doing so. Mr. L. A. Beckett is exhibiting cars and chassis of a special type, to which he has given his own name. These are made either in a single-cylinder 8-h.p. size or with a 16-h.p.

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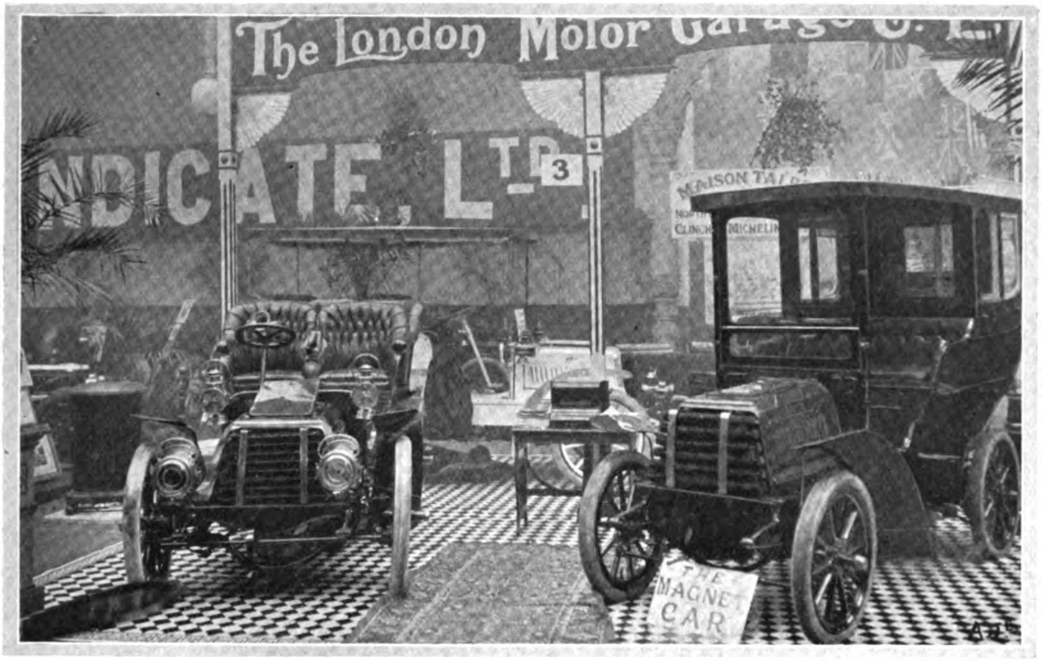
* AUTOMOTOR JOURNAL, Page 64, Vol. VIII.

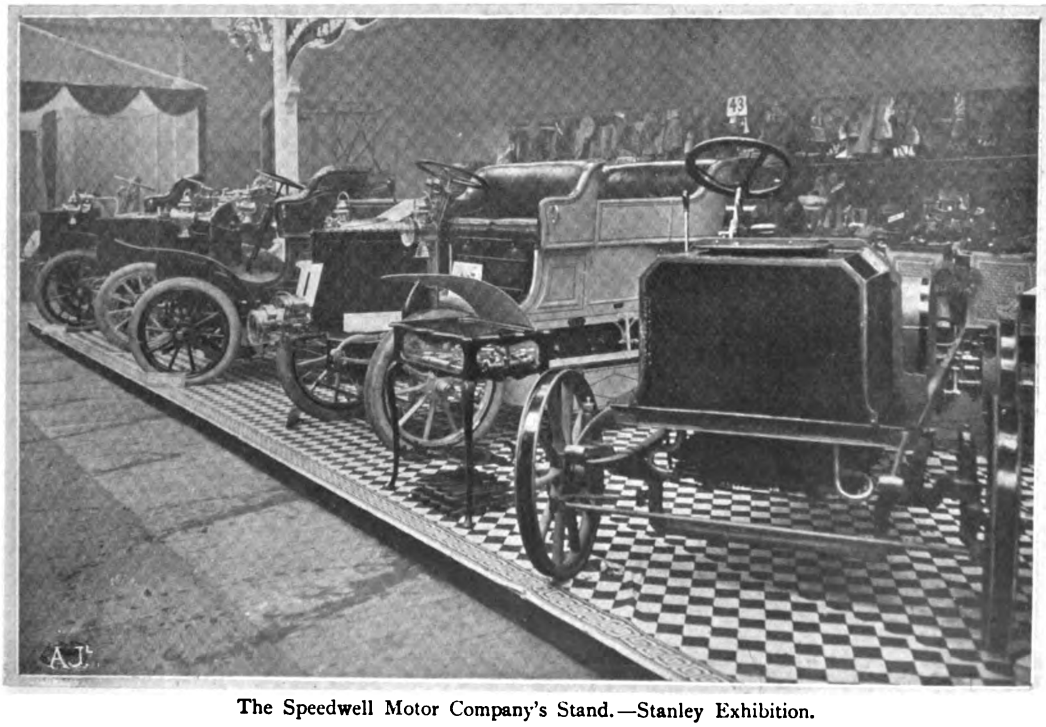


The London Motor Garage Stand.—Stanley Exhibition.

2-cylinder motor. We must defer our illustrated description of these vehicles until next week.

The Prunel Company, of Paris, showed one of their latest 2-cylinder chassis, and also a complete 4-cylinder car. The main frame of the chassis is built of wood with steel flitch plates, and has an angle underframe for the engine only. It is fitted with a 12-h.p. Aster motor, with atmospheric inlet valves, with a change-speed gear giving a direct drive on the top speed, and the power is transmitted from a countershaft to the rear wheels by side chains. The fork operating the main clutch is carried by steel pillars which project forward from the gear case. Flexible couplings are fitted in the countershaft. Both in design and finish it is a neat piece of work.

Messrs. Haynes and Son showed samples of the Wartburg light cars, which were described lately (Jan. 3rd, pp. 5–9), including one fitted with a parcel-delivery body of small size. The well-known Oldsmobile was in evidence in the Exhibition, Evart Hall, Limited, showing two or three of them on their stall. Another light American vehicle was exhibited for the first time by the English Motor Company, of Hanover Square, It is named the Oilmobile, and is in general respect,



The Speedwell Motor Company's Stand.—Stanley Exhibition.

The Clincher-Michelin Stand.

Joseph Lucas (Limited), Stand.

equipped with propelling mechanism of similar construction to the Oldsmobile. The body, however, is carried upon four semi-elliptic springs, and steel wheels, shod with Dunlop tyres, are employed. The carburettor is of the float-feed pattern, but it differs materially from any others that we have seen. For obtaining an additional supply of petrol at starting, a small rubber tube is taken from the top of the float chamber, and is connected to a rubber ball beside the driver. By squeezing the ball the float is displaced, and more petrol is admitted to the chamber. The engine is said to be capable of developing 6-brake-h.p. The foot pedal which applies one of the brakes is so arranged that it throws off the gear when depressed.

Amongst the steam cars a great variety of types were shown, ranging from the light American steam vehicles as represented by the Prescott and the Toledo cars, up to the heavy steam lurry invented by Dr. Brightmore. The Prescott vehicles, which are shown by the Houk Automobile Company, are unchanged since our description of them in August last, pages 459, 460 and 461, Vol. VII. The Toledo cars are fully dealt with elsewhere in the present issue, and a fully illustrated article on the Brightmore steam lurry will be found on pages 452 to 458, Vol. VII.

Of the larger size private steam vehicles, the Speedwell Company made an excellent show with their French Gardner-Serpollet models, and the New Automobile Company exhibited one of the latest 10-h.p. Miesse vehicles which the Company are building in their Wolverhampton works. On the Speedwell stall, the new 40-h.p. Serpollet chassis, which was shown in Paris, and is illustrated on page 94 this week, formed a great attraction. We give a photograph of the new Miesse vehicle, but hold over any description of it for a future occasion.

Electric vehicles were shown by Messrs. Mildé and Company and by Messrs. Shippey Brothers, the former were represented by a brougham of their standard type, and the latter exhibited models of the Still cars.

The Fleuss Auto Boiler Syndicate exhibited a model of the automatic device which they are putting upon the market for maintaining the water at a constant level in the boilers of steam cars; they also had a Milwaukee car on their stand fitted with this device. The apparatus consists of a mechanically driven measuring device, into which the water is forced by the feed pump, and which only allows it to pass into the boiler if the level there is below the normal; the water is otherwise by-passed back through an ingenious rubber check valve to the supply tank.

The North British Rubber Company made a special feature of Michelin tyres, which they are putting on the market in this country as the Clincher-Michelin. A special apparatus was also fitted up and shown running on the stall to demonstrate the effectiveness of the Michelin tyre-

Dunhill's Motorities Stand.

J. W. Lovegrove's Stand.

guard. A wheel fitted with a pneumatic tyre was kept revolving at a high speed pressed against a large roller, and nails were fed down between them so as to be taken up in the tread of the tyre. The guard unfailingly removed them from the tyre as they came round to it.

A special exhibit was that made with the Rucker pneumatic vehicle tyre. Considerable interest was shown in the unburstable inner tube, which is the most important characteristic of the tyres. The inner tubes are made by closely winding a thread round an inner surface of rubber before it is vulcanised. Another layer of rubber then covers the threads, and the whole tube is vulcanised up together. The thread employed is ingeniously woven so that one of its strands which is wound round it causes the main core to assume a spring-like shape, and, therefore, shortens it materially. Were it not for this single strand about it the thread in the inner tube would make the tube inexpansible, and it would, therefore, be unable to fit against the outer cover of the tyre. As it is, however, the tube is only rendered inexpansible when first made because of the single strand shortening the main thread, and when the tube is first fully inflated, this single strand is broken at many points by the strain, and consequently allows the tube to then expand to a larger diameter until the limit imposed by the lengthened main thread is reached. The makers have not only laid themselves out to supply new single tubes made on this principle, but can treat existing tubes in a similar way so as to render them unburstable. In these cases they wind their special thread closely round the tube and then give it a coat of rubber solution. A rim fitted with an ordinary cover, and with one of these inner tubes, was exhibited on the stall, with parts of the rim cut away entirely, showing the inner tube fully inflated in places, and thus demonstrating its power to withstand a normal working pressure without any external support. So long as the cover prevents the tube from increasing in size longitudinally, that is, in diameter, it is able to stand an enormous pressure.

Another feature of the Rucker tyre is the employment of a protective band between the inner tube and the crown of the cover. It is built up of alternate strips of wood and rubber laid transversely and vulcanised up into a complete band. The wood renders it inextensible transversely, and the rubber allows it to elongate circumferentially. In some cases this band is made a part of the cover itself. The tread employed on the Rucker tyre is flat where it meets the road, and it is constructed with several layers of exceedingly strong thread wound circumferentially and imbedded in it. The layers are enclosed in a thickness of canvas in order to prevent the thread from spreading sideways, and the object of the thread is to give elasticity whilst preventing extensibility longitudinally. The walls of the cover in the makers' own tyre are extremely thin, and are constructed of fabric having radial threads only.

In the way of single-tube tyres, Messrs. Shippey Brothers showed samples of the American Diamond tyre, for which they are agents.

Messrs. Lucas had a fine exhibit of the many accessories, for the excellence of which they have made such a name for themselves. We give a view of their stall, but space prevents any detailed description of the many useful fittings and other parts in which they continue to keep up to date. Amongst others exhibiting motor accessories we noted the stalls of Mr. J. W. Lovegrove and Mr. C. R. Base, both of these well-known caterers for motorists in the way of motor clothing having taken up the sale of various useful parts in addition to their clothing departments. Attention to the outward and personal comfort of automobilists has also been given by Mr. A. Dunhill, and by the Furriers' Alliance, both these concerns showing their latest productions in the way of motoring garments.

* * *

FOURNIER'S challenge to Alexander Winton, which we announced last week, has been accepted, subject to the race coming off after the Gordon-Bennett Cup, as Winton is not inclined to take any chances before that event.

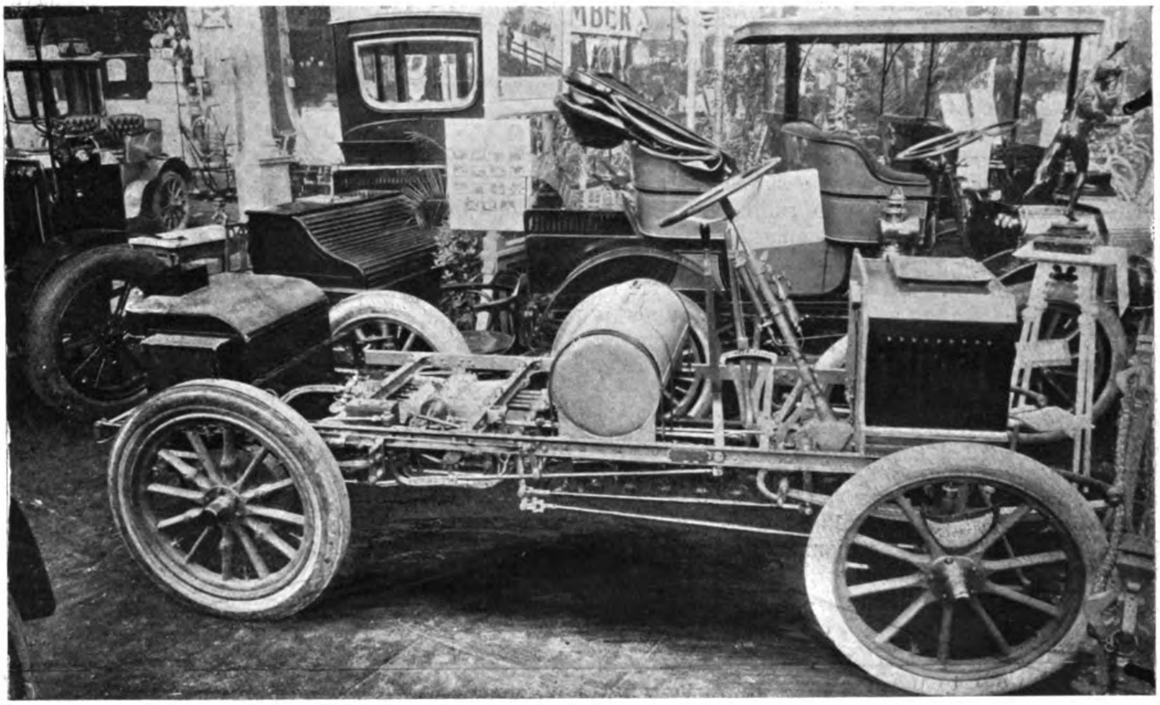
SIXTY or more entries have now been received for the Circuit des Ardennes, amongst the latest beyond those already announced by us being six De Dietrich, three Gobron Brillié, and three Sarolea motor bicycles.

THE Arenberg Alcohol Challenge Cup will be run off this year in connection with the Paris-Madrid event between Paris and Bordeaux. The Cup is offered by Prince d'Arenberg for French vehicles using a 50 per cent. alcohol mixture as fuel over a course of not less than 300 kiloms. in a single stage. The present holder is M. René de Knyff, who secured the Cup last year between Paris and Belfort in the Paris-Vienna Race.

A BRAKE competition is announced in connection with the Nice Automobile Week, the date selected being March 28th. One test will be for wheel brakes, and another for an emergency brake acting direct on the back wheels, and unconnected either with the motor or the differential. The trial is open for cars weighing at least 650 kilos., including all accessories, and, in addition, carrying 4 passengers or their equivalent weight. The wheel brake competition will consist of a sudden stop whilst running ahead, a stop whilst running backwards, and finally an endurance test on a descending course of 8 kilometres at a minimum speed of 15 kilometres an hour. The emergency brakes will be tested running forwards and backwards, and consideration will be given by the judges to brakes which are applicable to all classes of vehicles. Entries will be received until March 27, fee, 20 francs.

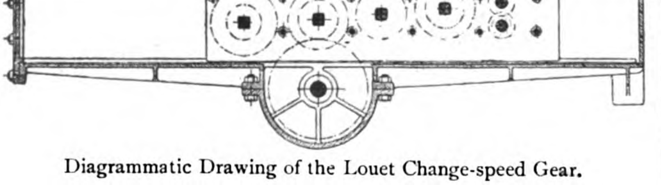
A LARGE number of entries on the opening day were lodged for the Paris-Madrid race, but a number of them did not comply with the regulations, and have, therefore, not been accepted for the moment by the A.C. de France. There are the usual four categories, viz., motor bicycles, voiturettes, light and heavy cars, and the main points of the rules for entry are that anyone entering a single vehicle need not, at the time, specify the make of the car, but must be on the vehicle during the whole race. Any person entering several cars must, at the same time, name the makes of the cars, and before May 15th must supply the name of the driver of each car. Failing such name being given, the deposit is forfeited and the car will not be allowed to start. In addition to cars being entered by individuals, vehicles can also be entered by "groups" of four for a special classing, that is, each maker may enter in each category groups of four cars of their make, notice of such group having to be given by May 20th, after which date no change in the grouping of the cars will be allowed. Only one group from each maker in each category will be permitted. The chief entries to date are 6 Mercedes, 12 Panhards, 3 Gobron-Brilliés, 8 Aders, and 10 Mors cars. Mr. Mark Mayhew is in the list for a heavy car.

THE ANNUAL A.C.F. SHOW IN PARIS.—Part VI.



The New 40-h.p. Serpollet Chassis (*see* page 96).

ANOTHER vehicle constructed on novel lines was that shown by M. Louet, who, in addition to employing a 3-cylinder motor with mechanically operated inlet valves, utilises a special form of change-speed gear. This gear is shown diagrammatically in our illustration. We are unable to give a complete description of it, but can sufficiently explain the principle on which it is constructed. It will be noticed that a gear-wheel is mounted in a fixed bearing at the top of the casing, and that another is similarly fitted beneath. These two wheels project into the main body of the casing, which is square in cross-section, and in which a cage slides containing five trains of gearing, with their wheels supported in bearings in it. The gear wheels on the sliding portion are so arranged that either train, alternatively, can be brought into mesh with both the upper and lower wheels above referred to, and that train then transmits the power across from the lower to the upper, and varies the relative speeds of the two wheels. The driven, and the driving wheels are not arranged in line opposite one another, so that in the position shown, which is the third speed forward, the upper one is in mesh with a larger intermediate wheel than that which is in gear with the lower one. The lower one is driven by the engine, and the power is taken from the upper one to the back wheels of the vehicle. Four speeds and a reverse are provided. It is pointed out by the maker that when the wheels are brought into mesh, the whole width of each tooth is simultaneously brought into contact, and that therefore there is less risk of damage being done by an inexperienced driver. He also claims that all tendency towards bending the shafts carrying the wheels is eliminated. When either gear is in its working position the sliding member carrying the trains is held in the correct position by a pawl which is seen in the drawing, engaging with one of the slots provided for this purpose.



Diagrammatic Drawing of the Louet Change-speed Gear.

Messrs. Meran and Gervais also exhibited a car fitted with a novel type of transmission gear. The change-speed gear employed by them in some respects resembles the Louet gearing, although in other characteristics it is not unlike the Rochet design. The various gear trains for giving the different speeds and a reverse are mounted upon a disc which can be rotated about its axis. Each train of wheels is so made that the driving and driven shafts transmitting the power to and from it are in line with one another, and each of these shafts is provided with a jaw clutch fitting on its projecting ends. The engine is mounted in the usual manner beneath the bonnet in front, and the power is taken by a longitudinal shaft to the live-rear-axle. The forward ends of the propeller-shaft and the rear end of the engine-shaft are in line with one another, and the change-speed gear connects them together. They are both provided with facing jaw clutch members, these members being so arranged that they can be brought nearer together or separated further away from each other by the driver. These clutch members fit into those already referred to on each train of the gearing, and either of the trains can be made to connect them together through it. A single vertical handle operates the change-gear. It projects upwardly through the centre of the floor board in front of the driver's seat. The handle is connected with the sliding jaw-clutch members in such a manner that, when it is lifted, it draws them apart from one another. The handle is also connected by bevel-wheels with the disc carrying the trains of gear, so that when it is turned round about its axis it rotates the disc and enables the driver to introduce whichever train he desires between the crank-shaft end and the end of the propeller-shaft. As soon as the desired gear has been brought into position, the driver releases the controlling handle, and allows it to resume its normal position, thereby causing the two jaw clutches to come into engagement with one another. It will be understood that a direct-through-drive is easily obtained for the top speed, in fact, no gear-wheels whatever are introduced between the crank-shaft and the propeller-shaft when that speed is in use; the revolving disc carries a short shaft with jaw-clutch members on each end for this speed.

Another novel feature was employed on the same vehicle, the object of which is to enable the owner to change the gear-ratio between the motor and the road wheels in much the same way as is done by changing the sprockets on those cars which are provided with side chains. The casing in the centre of the live-rear-axle is made in such a way that the differential-gear, with the bevel-wheels driving it, can be removed bodily. The two shafts from which the power is taken from the differential to the road wheels are not connected direct to them, but are quite short, and have spur wheels fixed on their ends close up to the differential. The two halves of the live axles terminate inside this central casing, and their inner ends carry other spur-wheels, which mesh with those above referred to. All these spur-wheels are mounted removably on their respective shafts, so that other wheels of different size can be introduced, and the gear ratio thereby changed. Although additional frictional losses are doubtless involved, yet in certain cases it might be a convenience to be able to vary the gear ratio in a car of this type. The makers showed 2-cylinder and 4-cylinder vehicles fitted with these transmission devices.

The Rochet Company exhibited samples of their well-known voiturettes, and made a special feature of a new direct-through-drive change-speed-gear, which they are fitting to their new 6-h.p. models. They are also making a 12-h.p. 4-cylinder car, which has a gear-box of a similar character, except that side chains are used instead of a longitudinal shaft with live-rear-axle, and that four forward speeds instead of three are available. In the 4-cylinder chassis the gear-box is carried on an under frame, and the engine is fixed to angle brackets on the main frame. The motor is provided with magneto ignition on the Simms-Bosch system, and atmospheric inlet valves are employed.

Amongst the other voiturettes in the Exhibition that of Prosper Lambert attracted a considerable amount of attention, owing to its many good features of design and to its low price. Its main frame is built of light channel steel and is stiffened by cross members. Steel flitch plates are also fitted along each side, and the corners are provided with angle plates both above and beneath. Projecting spring horns also assist in strengthening the corners. The underframe is of a similar section. "Underframe" is perhaps a misnomer for it, since it is practically on the same level as the main frame. The motor is of the single-cylinder water-jacketed pattern, with atmospheric inlet valves. It is said to develop about 10 actual h.p., and it is fitted with a centrifugal governor on the crank-shaft which operates a throttle valve. The starting handle is irremovable, and its shaft, when pressed inwards, engages with the crank-shaft through a pair of spur-wheels. The change-speed gear has its first-motion-shaft immediately above the second-motion-shaft, it provides three forward speeds, which are controlled by a side lever, and a "reverse," which is brought into operation by a separate handle on the steering pillar. A flexible-coupling is fitted between the main clutch and the gear-box, and the power is taken from the gearing to a live-rear-axle by a universally-jointed shaft. Distance-rods are fitted each side between the rear axle and the frame. The lubrication of the bearings is well provided for, and on certain parts ring-lubricator bearings are used. The differential gear has spur-wheel planets, and the gear wheels throughout are of comparatively large size for a voiturette. They are all made of hardened steel. The usual brakes are fitted, the one on the rear end of the second-motion shaft being operated by a foot pedal, and the side brakes being applied by a hand lever. The former has metal-to-metal friction faces, and the latter are of the internal pattern, and are compensated. The steering gear is of the worm and worm-wheel pattern, as in larger cars. The front axle is tubular, and the rear axle is stiffened by stays on its underside. A water tank is provided on the front of the dash, and a positively driven pump circulates the water through a radiator in front. The petrol tank is carried beneath the seat, and the carburettor is of the float-feed type. Ball bearings are provided for the front wheels and for the back axle. The chassis shown had wire wheels, but we understand that wooden wheels will be fitted for the English market—for the British Germain Company. The gear lever is moved rearwardly from its neutral position for the first speed, and forward for the second and third speeds.

Of other vehicles fitted with petrol motors, the Thirion self-propelled fire engine and the Fouillaron cars may be given brief mention. The fire engine has its motor and gearing arranged in front, and the power is taken to a live rear axle by a longitudinal shaft. The fire pumps are mounted centrally on the channel frame, and are driven by a chain off the gear shaft, a jaw clutch being employed for establishing the necessary connection to the pumps when required. The vehicle is said to be able to travel at a speed of 22 kiloms. per hour on a level, and the delivery of the pumps is given as 40,000 litres an hour.

The feature of the Fouillaron car is that the power is transmitted through a specially-constructed belt from one expanding pulley to another. The pulleys are built up of interlocking arms, which are so mounted that the two members carrying the arms, alternately, can be brought nearer together along the shaft in order to increase the diameter of the pulley, and *vice versâ*. The two pulleys are mechanically connected together so as to work conversely, and a spring is introduced in the system so as to maintain a constant tightness of the belt. The belt used has a triangular cross-section, and is built up of a large number of strips of leather through which eight circular gut bands pass.

Amongst the steam cars, the Locomobile Company had the largest exhibit. Their stall in the large hall was supplemented by another stand in the basement, amongst the running machinery. One of their vehicles was here mounted with its wheels running upon drums, from which the power was taken to a large centrifugal pump delivering water into a tank. The vehicle was thus running continuously under its own steam, and it well demonstrated the silent working of these well-known vehicles.

The Gardner-Serpollet Company had a very attractive exhibit. Their most noticeable novelties were the new racing car, which we have already illustrated, and their 40-h.p. chassis, of which we now reproduce a photograph. This new design is in many ways a great improvement over previous models, for not only is it of lighter construction throughout, but the parts are more readily accessible. The engine is carried beneath two straight cross members of the main frame having an H section. It lies to the left side, and is connected direct with the live-rear-axle by a chain, running just inside the main frame. The cylinder heads are separate castings from the cylinders and contain the valves. The fuel and water pumps are mounted to the right of the engine, and are driven by an eccentric which runs at a slower speed than the crank-shaft. Their stroke can be gradually varied, as they are operated by a block which can be slid in a curved slot formed in a rocking quadrant; they are not operated by a composite cam as hitherto. It will be remembered that the British manufacturers of these cars at York adopted a somewhat similar device on their 12 h.p. vehicles some little time ago, but the actual construction of the parts differs considerably in this latest French model, and the pump plungers reciprocate at a lower speed than in the earlier arrangement. The lubricator, with its force pump, remains unaltered. It is now, however, fixed on the right-hand side of the chassis, and is more readily accessible. The hand levers which vary the throw of the feed pumps and control the reversing gear on the engine are fitted to the left of the steering pillar, and are of considerable length. They work in quadrants, and are much more like the gear levers employed on petrol cars than they used to be. The connections between them and the mechanisms they operate are very direct. The boiler employed is larger than hitherto, and is fixed on a lower level. The junction tubes between the coils are arranged on the right-hand side and the tubes are longer and larger than before. A radiator of the finned-tube type is used; it has two layers, and is fixed horizontally beneath the front of the car. The oil tank is of large size, and is cylindrical. It is seen in the illustration, and lies across the car beneath the driver's seat. It and the water tank are said to have sufficient capacity for running a distance of 200 kiloms. The main frame is somewhat wider than in the older 12-h.p. model. The chain can be tightened by small adjustment bolts, which move the front ends of the rear springs backward, relatively to the frame, and there are no distance rods. The pressure gauges are now mounted on the dashboard, and the steering pillar merely carries the relief valve and the small hand pump for maintaining the air pressure in the fuel tank.

The Chaboche Company also showed nicely finished vehicles fitted with their special steam system, but they still maintain their original policy of reticence concerning details of construction.

(*To be continued.*)

MOTOR RACING: SPORTING AND EDUCATIONAL.*

MR. JARROTT, at the outset, remarked that if a Briton is not sporting he is nothing, and however a pastime may appeal to him his sporting instinct predominates. Plunging at once into the history of automobilism, he referred to the Paris-Bordeaux-Paris race in 1895, when Mr. Levassor won on a 4-h.p. car, weighing about 12 cwt., covered the 732 miles in under 49 hours. As a physical feat it was marvellous. The whole distance without sleep or rest, the car requiring the closest attention the whole of that long time. The possibilities of the motor were proved by this race, and the average speed of nearly 15 miles per hour which was maintained seemed then marvellous. Seven years later, in June, 1902, Réné de Knyff, on a 70-h.p. Panhard, covered the distance from Paris to Belfort (253.3 miles) at an average speed of 46 miles per hour. Seven years' progress! And what a marvellous progress it had been.

Continuing the historical racing data from 1896, Mr. Jarrott reminded his audience of the leading events from that year up to date, pointing each race with some interesting little personal facts. The races mentioned were:—

Paris-Marseilles (1896), 1,061 miles in 67 hours (average 16 miles per hour). Won by Mayade, on 4-cylinder Panhard.
Paris-Trouville (1896), 173 kiloms. in 3 hrs. 51 mins. Won by Jaurin, on a Bollée.
Paris-Bordeaux (1897), 573 kiloms. in 15 hours = 38 kiloms. per hour. Winner, R. de Knyff.
Paris-Amsterdam (1898), 1,443 kiloms in 35 hrs. 47 mins. = 27 miles per hour. Winner, Charron, on 8-h.p. Panhard.
Paris-Bordeaux (1899), 351 miles. Winner, Charron, at 34 miles per hour, on 12-h.p. Panhard.
Tour de France (1899), 2,217 kiloms. in 44¾ hours. Winner, R. de Knyff.
Gordon-Bennett Cup (1900), Paris-Lyons, 556 kiloms. Winner, Charron, on Panhard, at 61 kiloms. per hour.
Paris-Toulouse-Paris (1900), 1,446 kiloms., in 26 hrs. 43 mins. Winner, Levegh, on a 24-h.p. Mors.
Paris-Rouen (1900), first alcohol race. Won by Giraud, on a 20-h.p. Panhard.
Paris-Bordeaux (May, 1901), 573 kiloms., in 6 hrs. 11 mins.; average, 53 miles per hour. Winner, Fournier, on a Mors. The Napier car made its first appearance in this race.
Paris-Berlin (June, 1901), 1,106 kiloms. in 16 hrs. 33 mins. Winner, Fournier. Jarrott took part in this event.
Circuit du Nord Alcohol Race (1902), 865 kiloms., in 11 hrs. 55 mins. Winner, M. Farman, on 40-h.p. Panhard; C. Jarrott, second.
Paris-Vienna (1902). Won by L. Renault.
Gordon-Bennett Cup (1902). Won by S. F. Edge on Napier.
Circuit des Ardennes (1902), 512 kiloms., in 5 hrs. 53 mins.; average, 54 miles per hour. Winner, C. Jarrott, on 70-h.p. Panhard. De Crawhez in this race covered over 60 miles in the first hour.

Coming to the question of the value of motor racing to the manufacturer and to the public, Mr. Jarrott considered that the general benefit to the trade and the good derived by the industry more than compensated the manufacturers for their heavy outlay. Consternation reigned in France among the makers when it was sought in the French Chamber of Deputies to suppress racing. It was, therefore, interesting to observe that the first race of last year was organised by the French Government as a part of their programme to encourage the use of alcohol as fuel, and so benefit the agriculturists. The rapid evolution of the automobile industry was due chiefly, he thought, to racing. The change from the short wheel base to the comfortable touring cars of to-day owed its inception to the racing cars of two or three years ago, as also wheel steering, longer springs, stronger axles, larger tyres, and the thousand and one improvements in an up-to-date car, as compared with a car constructed five years ago. It was obvious a carriage which would stand the strain of a big race would give little trouble when used for ordinary purposes under ordinary conditions. Again, the use of aluminium was the result of endeavours of the manufacturers of racing cars to secure the maximum of power with the minimum of weight. It was noteworthy that one year's type of racing car was turned into the following year's touring car. The new racing rules limiting the weight, he thought, would have a beneficial effect on the evolution of the perfect automobile, as lightness of construction was what was wanted as long as strength was not sacrificed. Tyre difficulties had also been largely surmounted by the reduction in weight, and it was from racing models this lesson was learnt so quickly.

Luck entered largely into racing. Bad luck was the lot of the first Napier car run for the Gordon-Bennett Cup, but perseverance, with the combination of fortuitous circumstances and a plucky driver—Mr. S. F. Edge—enabled the Club to be the holders of the Cup, which they all were going to make a hard fight to retain. Mr. Jarrott said: "The race has to be held in Ireland, and we have every one of us to do everything we can in bringing personal influence to bear upon the obtaining of the necessary permission. The course is there, and the race has got to be run there, or we shall have lost the finest opportunity of expressing that grand old English policy of 'what we have we'll hold' that ever nation had. It will be a terrible struggle to get that Cup again if France or Germany take it back across the Channel."

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* Excerpt from a paper read before the Automobile Club of Great Britain, January 16th, 1903, by Charles Jarrott.

Mr. Jarrott, in speaking of his first Paris-Bordeaux race on a motor tricycle, said riding such a machine partook of a physical effort, but had he known more of racing, many of his troubles would not have occurred. When 90 kiloms. from the finish, the rain came down in torrents, and he had short-circuiting troubles, he got off, laid down in the road, finished to the world, thankful that, so far as he was concerned, the race was over. Paris-Berlin, 1900, was his first experience in a big racing car. On the first day of that race, from Paris to Aix-la-Chapelle, he was convinced that the right procedure was to drive "red," and the escapes they had in the first 100 kiloms. were marvellous, resulting, ultimately, when taking a right-angle turn quickly, in the mechanician being thrown out, and it was only after this, upon being implored by his mechanician, that he steadied down. His most exciting race was, he thought, the Circuit du Nord, early last year. "It may have been caution, it may have been recklessness," said Mr. Jarrott, "that enabled me to finish second, but, however reckless one might feel, the sight of a car smashed up at the side of the road through having failed to take a corner was sufficient check on any hare-brained wish one might have to keep on the top speed and take everything in full flight; and when one has seen these things actually happen within 5 kiloms. of the finish in a race of over 900 kiloms. one realises how true the saying is that 'the race does not always go to the fastest.'"

In Paris-Vienna, on a 70-h.p. Panhard of lighter construction than any other Panhards in the race, all his care was wasted, as the Swiss and Austrian roads played havoc with his car, and, but for the one idea of "finishing" in his head, the troubles he had would have made him abandon the race in despair. He arrived on the Vienna racecourse with his governor broken, throttle gone, no exhaust box, running on the low gear, unable to change speed through the impossibility of taking out his cone, regulating his speed by the ignition, the frame of the car practically in half, no cap, no coat, no goggles, in fact with nothing, he must have presented a picture ludicrous to a degree, but indicative in a measure of the effort he had made to get his car through.

In conclusion, speaking of the Circuit des Ardennes last year, with his car going splendidly on a straight-away course, no stoppages, no towns, nothing to bother one, merely to drive and keep driving—he was able to win his first race on Continental soil—Mr. Jarrott gave his experiences of this race in the following words:—"My own ideas in regard to the race itself were somewhat peculiar, as I started feeling perfectly indifferent as to the result, which was somewhat different from the keenness I had previously felt at the start of other races in which I had competed, and it was only after I had really got going that the exhilaration of speed affected me, and I was going as fast as I could. In the first 50 kiloms. the sight of Jenatzy and his mechanician mixed up in a heap of broken fragments of what had previously been a complete motor car was not reassuring, but it was only the beginning of a series of such sights. Charron, De Caters, De Crawhez and a number of others piled themselves up at one corner or another, and as all the cars had been started the dust soon began to assert itself, and then the real troubles began. In the open stretches where the wind was able to take effect on the dust the road was clearer, but in the pine forests where the dust was unable to escape the air was more like a November fog in London than anything else I could describe. It was no use slackening speed, however, and on and on we went, with no other means of knowing we were on the road, except from an occasional glimpse of the tree tops on either side. My car was going wonderfully well, and as we passed car after car I could not help thinking that it was too good to last. At the corner at Longiers we executed a perfect manœuvre in turning clean round on the dust, a performance I repeated again two hours later. The best racing I had for any distance was with Vanderbilt, and for nearly 100 kiloms. we were endeavouring to get away from each other, and as there were only a few yards between us all the time (and we were, of course, passing other cars rapidly), I think I can safely say that it was the most exciting piece of driving I have had. At the end of the fifth turn I stopped to make sure I had sufficient petrol and water to carry me through, and it was there that Mr. Johnson told me that I had not passed Gabriel, and that he was just on in front, and I realise that my last 53 miles will be a stern chase. The dust by this time was fearful, and as we sped on I wondered if I could ever do it. On and on we went, and yet I could see no signs of Gabriel on the Mors. Eventually, about 30 kiloms. from the finish, I caught sight of a car far ahead, which we gradually overhauled. Sitting in the dust—unable to see a thing, and yet unable to pass—I knew perfectly that the car in front of me was travelling, if not as fast, nearly as fast as my own, and therefore it *must* be Gabriel. There was no question now of slowing at corners or taking things easily. It was a question—Who is to finish first? Striving my utmost, I could not get by, when suddenly the car in front slowed, and it was only by a hair's breadth that I managed to escape dashing into it from behind. Gabriel had stopped, and we were alone—only 7 kiloms. to the finish—and we thundered down the long hill into Bastogne, and pulled up amidst the greatest excitement: 5 hrs. 53 mins. for 321 miles, including two stoppages. It was only after the finish of this race that I realised how perfect everything had to be before it was possible to absolutely win. Had I known less, and therefore given away more, the race would not have been mine. Therefore I would say to those who would like to race, yet do not like to participate because they cannot *win*: 'Race first, obtain the necessary experience, and, provided you have the necessary amount of skill and judgment, *that good luck* which at one time or another visits all of us who take part in competitive sport will visit you, and your turn as the winner of one of the big events will come!'"

Mr. Mark Mayhew occupied the Chair and, after Mr. Jarrott had read his very interesting paper, invited discussion.

Mr. Roger Wallace, K.C., said they were now very hopeful that the Gordon-Bennett Cup Race would be held in Ireland. He stated very emphatically that the Club had approached nobody in an exalted position until they were sure that they could carry the matter out practically. He deprecated the premature efforts which had been made in certain quarters in this respect. He was glad to say that Count Zborowski, Mr. S. F. Edge, and Mr. Jarrott, who had been over the suggested route, all agreed that it was a good and proper one for the race. The Irish Parliamentary Party being split up, they were approaching each Irish member separately to subscribe to a petition to allow the race to be held in Ireland, pointing out to all of them the advantages which would accrue to the country. An excellent suggestion of Mr. Johnson's was that a number of tours should be organised to all parts of Ireland in connection with the race, so that the whole of the country would benefit by permitting the race. They intended to rely upon the Irish members and local support, which under these circumstances it was expected would be given. In regard to Mr. Jarrott's views as to the benefits to trade following automobile racing, he could thoroughly endorse them. He instanced the consumption of aluminium in this country, which had gone up 50 per cent. in the last two years, and this, no doubt, was largely due to automobilism.

Mr. Claude Johnson, speaking in regard to the 1,000 kilog. limit for cars for the Cup Race, mentioned that the question of classing vehicles by cylinder capacity instead of by weight, which had arisen recently in France, was rather curious, as two years ago it was suggested from this country to the French Club that a Cup should be instituted to be run for distinct from the Gordon-Bennett race, classification to be by cylinder capacity. Difficulties were raised by Chevalier de Knyff and others, and the idea was dropped in deference to the views expressed and the great experience which it was acknowledged they possessed. It was rather suggestive, therefore, that at the present moment this form of classifying should be revived and put forward as an entirely new idea.

Mr. Jarrott, in replying to the various speakers, referred to Baron Rothschild's paper, which was read the previous week, when the Baron expressed his ideas as to the limit of speed being reached at 98 miles on account of eyesight. Mr. Jarrott said he personally had not experienced any difficulty in seeing when travelling at 90 miles an hour, and thought, provided the machine would do the work, he would be perfectly able to drive at a speed of over 100 miles per hour. As to a suggestion that benefit would accrue by reducing the weight, whatever was done makers would still always crowd all the horse power possible on to the frame, sacrificing and cutting everything else down to the very finest possible point for the sake of the extra power.

A cordial vote of thanks to Mr. Jarrott concluded the evening.

In connection with the Gordon-Bennett Cup Race which it is proposed to hold in Ireland, a hill-climbing competition near Belfast, and a motor boat race in Cork Harbour will be organised.

A suggestion that the Gordon-Bennett Cup Race might under emergency be run on the Circuit des Ardennes is welcomed in Belgium. The active co-operation of the A.C. of Belgium is assured.

SEVEN YEARS OF AUTOMOBILISM TOURING AND CONSTRUCTION.*

(*Concluded from page 67.*)

"IN 1899 took place the first motor car race organised on the Riviera. The Daimler cars participated in this event and were well in at the finish, though they were not in the hands of such expert drivers as those representing the French makers. In the same year also was organised the first hill-climbing trial on La Turbie.

"We have now come to the year 1900. At this moment M. Jellineck and the Stuttgart engineers decided to modify the general dimensions of the underframe, and in a general way considerably lighten the vehicle, with a view of bringing it within the weight limit of 1,000 kilogs., which had been fixed by the Automobile Club de France for the cars taking part in races in the following year. In 1901 appeared on the Promenade des Anglais, at Nice, the first Mercedes of 35-h.p. It was scarcely possible to recognise in this new car the extremely heavy vehicle of previous years. The Mercedes had become lighter, more elegant, and especially more easy of management. It was then, in the race from Nice to Salons and back, that the mechanician Werner piloted my car, and won the race with an average of about 37½ miles an hour. But the French makers were preparing a revenge for the defeats they had sustained from the foreign vehicles in the events down the Midi, and in the memorable race from Paris to Berlin, a 40-h.p. Mors carried everything before it, and the Mercedes were defeated. A revenge was necessary, and it was not long coming, for last spring a Mercedes won the La Turbie climb, established the record for the mile, and left all its competitors far behind. The revenge was still more complete and still more sensational when the Mercedes, piloted by amateurs, were well in the front rank in the Paris-Vienna race. If, gentlemen, I am singing the praises of the Mercedes vehicles it is because, during several journeys I made in Germany, I had occasion to exchange observations with the constructors of the cars, and I think that some of my recommendations were not made in vain. It is not necessary to have a thorough knowledge of the theory of mechanics in order to construct a satisfactory motor vehicle. An experienced amateur can often give valuable hints to the engineer, for he acquires a practical knowledge of automobile matters which is only obtainable by long practice in the driving of cars on the road.

"It is far from agreeable to make allusion to the terrible accidents, such as I have unfortunately witnessed myself, when a culpable imprudence has sometimes resulted in the death of the victim. We may unfortunately all be the involuntary cause of a serious accident. You have laws and regulations in England which bind you down very closely as regards speed. It is scarcely in my province to advise you to follow them strictly to the letter. I have myself been too much troubled by your police regulations not to understand the irritation and annoyance that must take possession of you when, knowing that your car can travel at twenty miles an hour, you are not allowed to drive at more than twelve.

"Will you allow me to give you a few figures of the automobile industry in France? In 1900 the *importation* of motor cars in France was valued at 388,000 francs (or £15,520), and to 780,000 francs (or £31,200) in the first ten months of 1902. In 1900 we *exported* motor vehicles to the value of 7,259,000 francs (or £290,360). In 1901 the figure rose to 13,414,000 francs (or £536,560), and in 1902 the motor cars exported amounted to the considerable value of 26,551,000 francs (or £1,062,040). This short statistic is more eloquent than the longest dissertation.

"I should explain that in these returns the value of the vehicle is estimated by its weight. The value is calculated on the basis of 10 francs (or 8*s.*) the kilogramme (of 22,046 pounds avoirdupois), which is often greatly inferior to the selling price. Thus a car weighing 500 kilogs. would cost 5,000 francs (or £200), and one of 750 kilogs., 7,5000 francs (or £300), and so on. The cars weighing 1,000 kilogs., and the racing vehicles are often sold on the basis of 15 to 20 francs (12*s.* to 16*s.*) the kilog.

"There are 53 firms in Paris manufacturing under-frames and motors, and 17 in the provinces. The production of these firms for the year 1902 totalled 12,000 cars, in the construction of which 45,000 workmen were employed. There are about three times this number of men engaged in the other departments of the industry, such as the forges, steel works, foundries, works producing axles and springs, tyre factories, carriage building shops, carriage upholsterers, tanneries, lantern makers, &c., &c. The total number of men engaged in the industry would thus reach about 180,000. Each workman earns on an average £72 a year.

"The manufacture of pneumatic tyres also deserves a passing mention. We have in France two principal firms, the Societé Michelin, who in 1902 manufactured 15,000,000 francs (or £600,000) of tyres, and the Société Continentale (a German company) whose sales amounted to about 3,000,000 francs (or £120,000). Each of these concerns has about 2,000,000 francs (or £80,000) worth of goods in the charge of agents.

"You will see, from these figures, that the automobile industry in France has truly become a national industry. If it has attained that character, or, rather, that quality, in my own country, it is due principally to the stimulating influence of racing. For my own part, I am absolutely convinced that motor car races are not only of great utility, but that it is owing to them that French automobilism has been able to make such remarkable strides during the past few years. The makers would never have consented to go to such an enormous expense, to impose upon themselves such great efforts and huge sacrifices for ordinary customers as they have been called upon to make in order to compete with each other and build up a reputation in races. They have succeeded in building vehicles to withstand enormous strains and capable of travelling at 77 miles an hour. Racing has, therefore, a great advantage, not only in the way of increasing speeds, but more especially in perfecting the construction of vehicles.

"And now, as a medical man, I would remind you simply of the well-known axiom, which applies so well to sports as to other things, that any excess is an abuse, and that as soon as a feeling of fatigue follows upon the exercise of a sport you may be sure that there has been too much of it.

"According to the physical condition of individuals what is an excess for one may not be an excess for others. A ride in a motor car of two hours in the morning and of three hours in the afternoon constitutes an exercise which is not only very agreeable but is not likely to cause fatigue. With a sufficiently long sleep of, say, seven or eight hours a man can easily ride five or six hours in an automobile daily without feeling any sense of lassitude. But if you exceed a speed of thirty miles an hour, it is not advisable to drive more than four or five hours a day, for under these conditions the excess manifests itself in a sort of cerebral fatigue caused by the continual concentration of the mind. This kind of fatigue should above all be avoided for it has the inevitable result of enfeebling the will, which thus becomes less capable of guarding against imprudence.

"I would not advise any one to undertake journeys, as I have done myself, of 464 miles in a day, starting at four o'clock in the morning and arriving at ten o'clock at night at Stuttgart; or leave Paris after lunch at two o'clock and arrive at Calais for dinner; or leave Paris in the morning and lunch at Trouville, a distance of 149 miles, and return to Paris in the evening for dinner. But if automobilism is practised moderately, without excessive speeds, it can produce the most beneficial effects. A complaint which is very prevalent among certain classes nowadays, and is capable of having serious consequences for those afflicted with this nervous disorder, is neurasthenia, and this has on several occasions been entirely cured by motor car rides at regular and frequent intervals. Hypochondria, and certain affections usually subjected to the air cure, can be treated in the same fashion."

Mr. Roger Wallace, the Chairman, in thanking the Baron for his interesting paper, invited criticism or supplementary remarks, to which the Hon. J. Scott-Montagu, M.P., Mr. Mark Mayhew, and Mr. Worby Beaumont, briefly responded.

At the request of Mr. Ashton Johnson, Baron Rothschild expressed his ideas as to the car of the future. He had seen the latest Serpollett 130-h.p. machine, which, he said, had done about 92 miles an hour. On level ground it would probably go at the rate of 100 miles an hour. As to petrol cars, he had just come from the Camstatt-Daimler works, where he had been allowed to see the new engine built for the Gordon-Bennett race. It had a 100-h.p. motor, the machine was 4 metres long, and the length of engine was 3 metres, the seat for the driver being at the rear. The steering was horizontal, not straight. The vehicle had been timed whilst running at the rate of 98 miles an hour, and whilst going at this pace the driver had been compelled to stop, finding it impossible to steer it at such a pace.

Mr. Wallace, in proposing a vote of thanks to Baron Rothschild, said in regard to the high speeds mentioned, he doubted if the mechanism would be able to stand up to the work. As to the feelings of this country towards automobilism, there was a dogged determination that we were not going to be beaten, and we meant to hold our own. At the same time, however, we would always acknowledge the assistance given by other countries, and the Club had always felt that we owed much in the development of the industry to the start given by France, and that was why they had asked Baron Rothschild to give the first paper to the Club.

Baron Rothschild gracefully responded by stating that the champions of sport would always be Englishmen, and there was no doubt that in the future it would be to England that other countries would come to learn.

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* A paper, by Baron H. de Rothschild, read before the Automobile Club of Great Britain and Ireland, on January 9th, 1903.

The Automotor Journal stand at the Crystal Palace Show, opening next Friday, will be No. 56.

A new two-seated light motor car is to be marketed shortly by the Eclipse Machine Company, of Oldham.

An important development in connection with the Brooke car will in all probability be shortly announced.

It is proposed by the Swansea Corporation to adopt motor vehicles for the municipal work. Tenders are to be invited for this purpose.

Clapham Common and Camberwell Green are now linked up by means of a public motor omnibus service, which runs *viâ* Acre Lane, Brixton, Coldharbour Lane, and Loughborough Junction.

The Northampton County Council is reported to have authorised a committee to frame bye-laws regulating the speed of motor cars. It might save this committee trouble if, before they started on their labours, they took the trouble to obtain a copy of the Locomotives on Highways 1896 Act, together with the regulations imposed by the Local Government Board, and ascertain therefrom the limits of their powers.

"The Paris Automobile Salon, 1902," was the subject of discussion at last week's dinner of the Society of Motor Manufacturers and Traders. Some extremely interesting points were raised by several of the speakers. Amongst those who gave the guests the benefit of their opinions were Messrs. Charles Jarrott, H. G. Burford, J. E. Thornycroft, M. H. Buckea, W. E. Hall, T. Clarkson, B. Nadall, W. H. Peckham, T. G. Chambers, A. Brampton, and C. R. D'Esterre.

The Derby and District Automobile Club, although recently founded, already numbers nearly 40 members. Mr. G. A. Strutt, of Makeney, is president, the vice-presidents being Mr. C. L. Schwind; Mr. Maurice Hunter, of Belper; Mr. Frank Lawson, of Foremark Hall; and Dr. Vaudry, of Belper. Mr. C. J. Allin is acting as honorary secretary, the headquarters of the club being at St. James' Hotel, Derby. The inaugural run is taking place to-day (Saturday), with Loughborough as the destination.

The Automobile Exhibition which Mr. Charles Cordingley again holds at the Agricultural Hall from March 21st to the 28th—this year under the auspices of the Automobile Mutual Protection Association—promises to be as successful as those which Mr. Cordingley has run in the past years. Already the whole of the ground floor, Minor Hall, Arcade, several annexes, and most of the gallery have been allotted to firms of motor manufacturers and others in Great Britain and abroad, and in several instances we learn that exhibitors are expending considerable sums—amounting in one instance to £600—in the decoration of their stands.

The recently formed Ivel Agricultural Motors, Limited, of Biggleswade, will find its London home at 45, Great Marlborough Street, W., where the business arrangements will be looked after chiefly by Mr. Chas. Jarrott, who is one of the directors of the company formed to exploit this excellently conceived mechanical arrangement. With Mr. Jarrott are associated as directors Lord Willoughby de Eresby, the inventor Mr. Dan Albone, Mr. S. F. Edge, and Mr. J. H. Hewitt. It will be remembered that we have fully described and illustrated in past issues of the Journal the functions which the Ivel motor is capable of performing, There is no doubt that if a quantity of these useful tractors are put into active operation throughout the country districts of Great Britain, that the effect will be largely to eliminate the prejudice which at present exists in the mind of the agriculturist in many parts of the kingdom. The British farmer is slow to move, but nothing appeals to him more than economy in working, and a little practical proof of this will speedily bring about a great reform in farming methods.

A visit was paid last Saturday by the members of the Yorkshire Automobile Club to West Huntington Hall, near York, the residence of Mr. and Mrs. Kirk. The occasion was the opening run of the season, and amongst those present were:—Mr., Mrs., and Miss Benn and Mr. I. E. King, 22-h.p. Daimler; Mr. H. R. Kirk, Mr. Bolton, and Mr. Smith, 12-h.p. Gladiator; Mr. and Mrs. Hepper and Mr. Jones, 12-h.p. Belsize; Messrs. T. and T. H. Atkinson, 9-h.p. Clement; Mr. and Mrs. Armitage, 9-h.p. Clement; Mr. Woolf and Mr. Hay, 9-h.p. Clement; Mr. Wentworth Clark, Clement; Mr. and Mrs. Whitaker, 10-h.p. Lanchester; Mr. and Mrs. Beevers, 8-h.p. M.M.C.; Mr. A. W Dougill (Hon. Sec.), Mr. Ramsden, and Mr. Braime, 8-h.p. Loidis; Mr. and Mrs. Parker and Mr. J. W. Smith, 8-h.p. Humber; Mr. and Mrs. Winn, 4½-h.p. Renault; Mr. and Mrs. Walker, 4½-h.p. De Dion; Mr. Mortimer and Mr. Wilson, 4½-h.p. Renault; Mr. Borland and Mr. Nichols, 4½-h-p. De Dion; Mr. Ellison, motor tricycle; and Mr. Chippendale, motor bicycle. Sixty-three visitors availed themselves of the hospitality of Mr. and Mrs. Kirk, the whole of the company afterwards undergoing the usual photographic ordeal before starting on the homeward journey. The enjoyment of the outing was enhanced by the delightfully bracing and frosty weather, The annual general meeting of the Club is announced to be held at the headquarters on January 29th.

Driving certificates are to be issued under the auspices of the Automobile Club, and a sub-committee, which includes Mr. Roger Wallace, K.C., Col. R. E. B. Crompton, Mr. Staplee Firth, Sir John Thornycroft, and Mr. Claude Johnson, has been deliberating upon the details of this important matter. The following decisions have been arrived at, viz., that the certificates shall be given for proficiency in driving, specifying whether by steam, electricity, or petroleum spirit, as the case may be; that certificates may be granted without the examination of the driver to those who drove through the 1,000 Miles Trial of 1900, the Glasgow Reliability Trial of 1901, and the Club 650 Miles Trial of 1902, also under certain conditions to those who, owing to the nature or length of their experience in driving are undoubtedly proficient. Provincial affiliated clubs will examine for certificates in the provinces, the Proficiency Certificates Committee being composed solely of drivers who have themselves obtained their certificates from the parent Club. Drivers' certificates generally will be available for the United Kingdom only, but certificates for driving on the Continent will be issued to members of the Automobile Club only. Paid drivers must have their certificates renewed yearly, and other drivers every three years. The certificate will be in the shape of a railway season ticket, and will have the name of the holder, his address, date of issue, registered number, and in the event of the driver not being a member of the Automobile Club his photograph, a duplicate of which will be placed in the Club register. A fee of *2s. 6d.* will be charged for the certificate, for the examination a charge of *10s.* will be made if the Club car is used, and *5s.* if the car is provided by the applicant. It is proposed to provide that no person shall take part in any trial, tour, or competition held under the A. C. Rules, unless he is a certified driver whose certificate has not been cancelled or is not suspended. The certificates may be withdrawn by the Club, and such withdrawal published together with the reason for the withdrawal. It is suggested that each certificate shall have a "Caution" on it to the effect that it may be suspended or cancelled in the event of the Club Committee being satisfied that the holder has driven in an inconsiderate manner or in such a way as to be prejudicial.

AN Automobile Club of New Orleans, U.S.A., has been founded.

THE second Marseilles Automobile Salon will be held from March 7th to 15th.

MR. CLARENCE R. DINSMORE has been nominated on the Gordon-Bennett International Committee as delegate of the A.C. of America.

HENRI FOURNIER is reported to have sold his new car, "The Empire State Express," to Mr. Hearth, of the *New York Journal*, for the sum of $25,000.

MR. WINDSOR T. WHITE is likely to be the President for the ensuing year of the American National Association of Automobile Manufacturers.

THE Automobile Club of Lombardi has been founded in Milan. Baron Franchetti is president, and the Marquis Soragna vice-president. The new club is very influentially supported.

M. PH. BOVET, director of Peugeot Frères, and vice-president of the Chambre Syndicale du Cycle et de l'Automobile, has been nominated to the Legion of Honour by the French Government.

Shows in America continue to increase in spite of the National Association of Automobile Manufacturers and the A. C. of America. Buffalo, N.Y., is the latest addition to the list where an exhibition is to be held in the second week in March.

A SECOND competition for a challenge cup is being organised by the Italian Automobile Club at Florence, to be held in May on the Pontassieve-Consuma hill and road, over a distance of 15 kilometres. Last year's winner, Chevalier Tonietti, made the time of 25 mins. 18 secs.

"THE greatest cycle tour ever made" is being organised from Boston, U.S.A. to St. Louis and back, the plan being to start from Boston in a body and gather in all motor cyclists *en route* at each town passed through. By this means it is claimed by the American organisers that such an impression will be created that the motor bicycle will be once and for all established as the greatest machine ever known.

PRESIDENT and Madame Loubet on Saturday last were driven by Capt. Jenty in a Serpollet car to Rambouillet, where luncheon was partaken of by the officers of the garrison, Madame Loubet, who was accompanied by her daughter, Madame Saint-Prix, returning in the same conveyance to Paris. This is worthy of note, as it is the first public appearance in an automobile of the wife of the President of the French Republic.

ANY purchaser of a motor vehicle at the Grand Garage de l'Avenue du Bois, 56, Rue Pergolese, Paris, on December 15th last, should communicate at once with the proprietors, as that is the date which was given in the envelope deposited with *L'Auto* under the offer of a prize of 1,000 francs to any purchaser of a car on the day, the date of which was enclosed in this sealed envelope. We published the particulars of this offer early in December last.

EFFORTS recently made in the United States to resuscitate the Automobile Company of America—the makers of the Gasmobile Car—have failed, and the final stage was reached recently when the machinery and stock were purchased by the Pan American Motor Car Company. The late General Manager of the Automobile Company, Mr. Henry C. Cryder, has transferred his services to a new Company termed the Moyea Automobile Company.

THE Belgian imports and exports of automobiles and parts for 1002 constitute a further object lesson of the rapidly growing importance of the industry. Whilst the exports of automobiles to England has increased in one year from 287,520 francs to 747,050 francs, and to Germany only from 60,355 francs to 112,300 francs, during the same period they have *decreased* to France from 253,280 francs to 190,000 francs, and the decrease is about in the same proportion to Holland and other countries. The imports, on the other hand, to Belgium from France have increased to 392,385 francs, the imports from all the other countries put together including England and Germany being practically of no appreciable amount. The same tale holds good in regard to separate parts, the imports from France amounting to 319,620 francs, the whole of the other countries again supplying practically nil, whilst the exports to England have more than increased three-fold, France, however, in this instance being supplied by Belgium with goods of 108,773 francs value.

LAW REPORTS.

Hodgson v. the Speedwell Motor and Engineering Company (Limited).—Mr. Justice Farwell, in the Chancery Division, on the 16th instant, had before him a motion in an action of Hodgson v. the Speedwell Motor and Engineering Company (Limited), and Hawkins, Gardner, and Serpollet, by which the plaintiff claimed, as exclusive licensee of a patent for the term of three years, of which one year was unexpired, an injunction to restrain defendants from licensing anyone else for the remainder of the term.

Mr. Upjohn, K.C., for the plaintiff, said the licence was to use the Gardner-Serpollet patent, and the Speedwell Company were now selling cars in breach of plaintiff's licence, under which the licensors bound themselves not to license anybody other than Mr. Hodgson for the term. Mr. Justice Farwell, after some discussion, adjourned the motion for a week.

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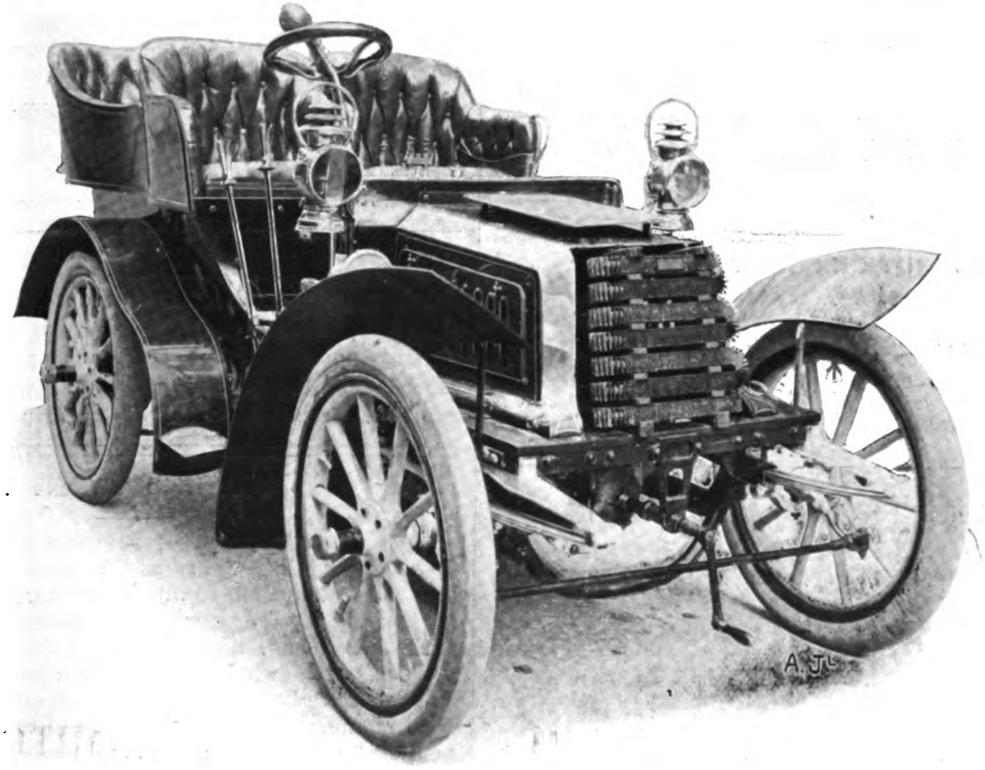

10-H.P. CHENARD AND WALCKER PETROL CAR (*see page* 105).

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CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.

Jan. 30 ...	... "Lubricators and Lubrication." Paper by Mr. Thomas Clarkson.
Feb. 13 ...	... "Motor Cars as Feeders for Railways." Paper by the Hon. J. Scott Montagu.
Feb. 20 ...	... "Motor Bicycles." Paper by Mr. Mervyn O'Gorman.
Feb. 27 ...	... "Recent Development in the Modern Automobile." Paper by Mr. H. R. Sennett. Annual General Meeting.
March 13...	... "The Motor Problem a Road Problem." Paper by Mr. W. Rees Jeffreys.
August ...	... Tourist Motor Bicycle Reliability Trial.
September	... The 1,000 Miles Trial.
1904	... Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.

Jan. 30–Feb. 7 ...	Exhibition, Crystal Palace.
Feb. 3–7...	... Liverpool Cycle and Motor Show.
Feb. 6–14	... Edinburgh Motor and Cycle Show.
Feb. 7–16	... Brussels Automobile Salon.
Feb. 9 ...	... Competition of Timing Apparatus (A.C. de F.).
Feb. 13–21	... Manchester Cycle and Motor Show.
Feb. 19 ...	... Consumption Trials (100 kiloms.) *L'Auto.*
Feb. 22–28	... Pau Automobile Week.
March ...	... Competition of Silencers (A.C. de F.)
March ...	... "Criterium du Quart de Litre" (*L'Auto.*)
March 1–15	... Berlin Automobile Exhibition.
March 16–30	... Vienna Automobile Exhibition.
March 20–28	... "Criterium des Transports Automobiles." 1,107 kiloms. (*La France Automobile*).
March 21–28	... Cordingley and Co.'s Exhibition, Agricultural Hall.
March 28–April 5	Nice Automobile Week.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 24 ...	... Paris–Madrid (A.C. de France). Entries until May 15. Double fees April 16 to May 15. Gordon-Bennett Cup Race.
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
July 5–12	... Aix-les-Bains Auto Week (Auto Club du Rhone).
July 19 ...	... Circuit Francaise. 400 kiloms. (Chambre Syndicale de l'Automobile).
August ...	... Circuit des Ardennes.
Oct. 15–21	... Leipzig Exhibition.

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SPECIAL NOTICE.

With the present issue an extra Coloured Plate Supplement is presented gratis. Every copy of the Journal should contain this Plate. As a specimen of photographic colour reproduction the publishers submit it would be difficult to equal and practically impossible to surpass.

PASSING EVENTS.

THE GORDON-BENNETT RACE.

THE very sensible tactics which have been adopted by the Automobile Club, to which we referred in our last issue, for popularising the project of holding the Gordon-Bennett Race in Ireland, are bearing excellent fruit, and the prospects of the whole movement are distinctly encouraging. Answers have been received from a very large number of Irish Members to the letter addressed to them by the chairman of the Automobile Club, and these answers have been without exception sympathetic. Some of them have been almost enthusiastic at the prospect. Thus Mr. Tim Healy says he will be willing to help in every way he can, and that the Committee may rely on the sportsmen being welcomed among the country people. He is particularly anxious that as many people as possible should be enabled to witness the event, and he is opposed in consequence, we think very reasonably, to commencing the race at three o'clock in the morning. He wants to give the people a chance of seeing the start. We fancy Mr. Healy's contention will find a great many supporters, not only from that point of view, but from the more egoistic one of the disinclination which even automobilists feel to rising from their beds at that unearthly hour. Colonel Nolan, member for North Galway, is not less emphatic. His view is that the race would do good in two ways. It will diffuse interest in mechanics, and ultimately, he hopes, tend to introduce automobile transit for agricultural purposes. Everybody who knows Ireland is well aware that the deficiency of means of communication, the relative absence of railways, and the preposterous freightage which existing railways charge, form one of the most serious obstacles in the development of the country, and some of these obstacles, at any rate, the introduction of the automobile should gradually remove. This general sympathy is very encouraging, and it fully bears out, as far as the Irish Members are concerned, what we said long ago as to the probable attitude of the Irish people on the subject.

Letters of a similar character to those addressed to the Members of Parliament have also been addressed to the Bishop of Kildare, and to the thirteen parish priests in whose districts the proposed course is situated. A very kindly reply has already been received from the Bishop of Kildare and Leighlin, who declares himself an "ardent advocate" of the race. It is too soon to expect replies from the parish priests, but as they are invariably courteous when courteously approached, we have little doubt as to what the nature of their replies will be. As we have already pointed out, the co-operation of the priests will be of the greatest value in many ways, and not least for the purpose of controlling the movements of the country people on and in the neighbourhood of the course while the race is being run.

The Kilkenny County Council has also followed the example of those of West Meath and Queen's County in passing a resolution—carried not only with unanimity but even acclamation, "expressing the desire that the Gordon-Bennett Cup Race should take place in Ireland, extending a hearty welcome to the competitors, and expressing a determination to do all that lay in the power of the County Council to facilitate matters with regard to the part of the course which it is proposed should go through this county."

Thus there seems to be no question that Ireland, at any rate, is fully alive both to the fun of the race from the sporting point of view, but also to the benefits it is likely to confer on the island. The Automobile Club, as we mentioned last week, has decided to render these as great as possible by organising in connection with the race both hill-climbing contests at Belfast, a motor boat race in Cork Harbour, and a number of automobile tours and excursions through different interesting districts. Of course, the beauties of Irish scenery are widely known, but the effect of affording automobilists an opportunity of personally becoming acquainted with them is bound to have an effect of increasing the tourist—and particularly the automobile tourist—traffic in Ireland which hardly anything else can equal. An important movement was inaugurated several years ago by Lord Aberdeen for the purpose of opening up the more beautiful parts of the island to tourists by organising means of communication and improving the hotel accommodation wherever necessary. This has already very largely benefited the country, and the movement can only derive increased importance when automobilists become more familiar with Irish scenery. The programme of the Automobile Club in connection with the race cannot fail to have a very powerful effect in this direction. Greatly regrettable, therefore, as it would be in the interests of the automobile industry in this country if the race is not permitted, the interests of large classes—in fact, almost every class of the community—in Ireland will suffer at least as seriously also. The prospects of future prosperity in Ireland are very largely bound up with the success of the tourist movement. The Gordon-Bennett Race will furnish a unique opportunity of promoting that movement, and it will be nothing short of a calamity if it is senselessly thrown away.

Of course, all along, the French have been under no delusions on the subject. They fully recognise that the holding of the race in this country will be of the greatest value to the British industry and a corresponding disadvantage to that of France. The Automobile Club de France have been far from accommodating in regard to the preliminary arrangements. It may be well, therefore, to call to mind that the French Club proposed in the first instance that the race should be shortened to 410 kilometres and finish at Belfort. To this the English Club promptly agreed. Then the Frenchmen changed their minds and thought they would like to run the race the full 650 kiloms. This involved the neutralisation of Switzerland, and the English Club's agreement to this was also asked, and they promptly agreed again; so that, as regards last year's race, the English Club set a very good example of sportsmanlike behaviour. We feel sure the same course will be ultimately adopted by the French Club in reference to this year's race, and that we shall find the attitude which they have hitherto taken up is merely the result of misconception on their part as to the real nature of the course proposed, for we do not think it at all likely that the Automobile Club de France would intentionally endeavour to prevent by obstructive tactics another country from benefiting by the advantages which they have enjoyed hitherto, though, of course, in the country itself there may be some feeling on the subject. This belief is strengthened by the last courteous letter of the Chevalier Renè de Knyff.

MORE AERONAUTICS.

We have previously referred to the first and second of Professor Hele-Shaw's lectures on Mechanical Locomotion, which dealt with the propulsion of vehicles on the ground. In his last lecture Professor Hele-Shaw left *terra firma* and proceeded to deal with aerial navigation. Appropriately enough, about the same time the Aeronautical Institution and Club held one of their not too frequent meetings, under the presidency of Dr. Barton, at which papers were read by Dr. Cook and Mr. Edward Mote. Professor Hele-Shaw dealt mainly with the flying machine proper, that is to say the machine which is raised in the air by mechanical power only. The experts of the Aeronautical Society were divided, Mr. Mote being wholly in favour of the flying machine, and Dr. Cook reposing his confidence in the navigable balloon as modified by himself. Which of these methods of aerial navigation is destined to play the greater part in the solution of the problem is at present wrapt in uncertainty. The only thing that is quite certain is that, as a rule, the supporters of one system are firmly convinced that the other is impracticable. We have endeavoured in this matter to sit firmly and impartially on the hedge, and as near the middle of the hedge as possible. At present the victories of either are rather Pyrrhic—"Another such victory and I shall return to Greece"—but both schools are very pertinacious, particularly in discussion.

◆

PROFESSOR HELE-SHAW devoted his lecture almost entirely to the problem of animal flight and the mechanics of the aeroplane. He pointed out that the experiments made so far with flying machines have been successful mainly in so far as they imitated what is called technically the soaring flight of birds. Admirable demonstrations in this art are given every day by the large colony of seagulls at present on the Thames, and Professor Hele-Shaw seems to have been observing them. He referred to the prolonged time that a seagull can remain in the air without moving its wings, and this is indeed remarkable. This, however, is in reality sliding down inclined planes of air. The inclined planes may be very slightly inclined, but if they are not inclined to the horizontal they are inclined to the wind. To be able to soar in this sense, the seagull has first of all to get up to a certain height, and for this, as Professor Hele-Shaw admits, great exertion is needed. So far, according to the Professor (and the history of the subject), Professor Langley's aeroplane is the only machine which has carried a motor on board and executed independent flight. After dealing with the experiments of M. Santos Dumont, Professor Hele-Shaw summed up the situation as follows:—"The balloon had a certain amount of safety, but was at the mercy of aerial currents, which are enormously greater than anything in the ocean. On the other hand flying machines, while more able to cope with disturbances in the air, are more dangerous, because if the slightest hitch occurred with the machinery they fell to earth like a stone." This is practically our own position, and amounts, as we freely acknowledge, to sitting on the hedge.

THE ACCURACY OF INDICATORS.

THE subject of indicators, both for steam and explosion engines, is of considerable importance, and it is on that account that we have recently devoted considerable space to the problems involved when dealing (in our issue of December 27th) with the M'Innes-Dobbie Indicator and Mathot Recorder, and the Hospitalier Indicator in our number of January 10th. The importance of the subject is being generally recognised abroad also, and an important paper has been contributed to the *Zeitschrift des Vereines deutscher Ingenieure*, by E. Roser, on the subject of testing and calibrating them. He points out that the temperature correction is a very important one. Of course, the displacement of the spring must be tested not merely under the different pressures to which it is to be exposed, but also as nearly as possible at the temperatures to which it will in practice be subjected. Now the pressures can be ascertained easily enough, though, of course, here the time function also comes in, as the displacement of the spring depends not only on the actual pressures prevailing in the cylinder, but also on the speed of running, as, like most other things of the kind, a spring has a certain amount of lag. The serious point, however, is that the temperature in the indicator itself never equals that in the cylinder. If the indicator piston leaks ever so slightly then the ratio is upset, and there is *less* difference between the temperature in the working cylinder than that to which the indicator spring is exposed. These sources of error are of considerable importance in obtaining accurate results with indicators. It is possible that they are not always accorded as much attention as they deserve, and Herr Roser's paper will, therefore, be of use in bringing them to the notice of engineers who may have neglected them.

A PROGRESSIVE CHURCHMAN.

SINCE the Rector of Charlwood exposed himself to derision by maintaining that last year's Reliability Trials had damaged the roads over which they took place to the value of £1,056 5*s*., we have not had occasion to refer to a dignitary of the Church in connection with automobilism. It is pleasant, therefore, to have a communication from a reverend gentleman in the Midlands unmitigatedly in favour of the automobile. He has watched for a long period of years and, naturally, with much concern, the gradual decrease in the population of the country villages around him and the consequent fall in value of tithes. It is satisfactory to know that within the last couple of years he has noted a sudden stop in both unpleasant forms of shrinkage. He attributes it to the arrival of the motor car on the scene, and we recommend his views for consideration in "the seats of the mighty" in counties nearer London. Automobilists unquestionably distribute a good deal of money in the country districts. Just as the bicycle saved the old coaching inns from destruction, so the automobile is making them prosperous once again, and a really prosperous inn in a country village means increased opportunities for nearly everybody. Our country clergyman is also well pleased with the prospects opened by the increasing cheapness of the motor vehicle He thinks that with a motor car, which will soon be within parson-purchasing-power, a clergyman could look after three or four livings better than he now does one. If the livings could therefore be combined all into one this would mean a proportionate increase in clerical incomes, that is to say of those that remain, though it does seem to involve the elimination of about two clergymen out of three. If the remaining incumbent is provided with a motor car, however, this will unquestionably benefit industry, and as the one clergyman is to become as useful as the three he replaces there will be no loss of theological efficiency.

THE AUTOMOBILE CLUB 4,000 MILE TYRE TRIAL.

THE report and awards of the judges are now issued. After full consideration and tests the following prizes are announced, these being offered by the *Daily Mail*:—

1st Prize, £100.—Dunlop Pneumatic Tyre Company, T 2.
2nd Prize, £50.—Collier Tyre Company, T 7.
3rd Prizes of £10 each, in order of merit as follows:—
Dunlop Tyre Company, T 1.
" " " T 3.
" " " T 4.
Maison Talbot Tyre Syndicate, T 6.

All previous available data has been published in this Journal. We propose to deal with the report in our next issue.

THE CHENARD AND WALCKER 10-h.p. PETROL CAR.—Part I.

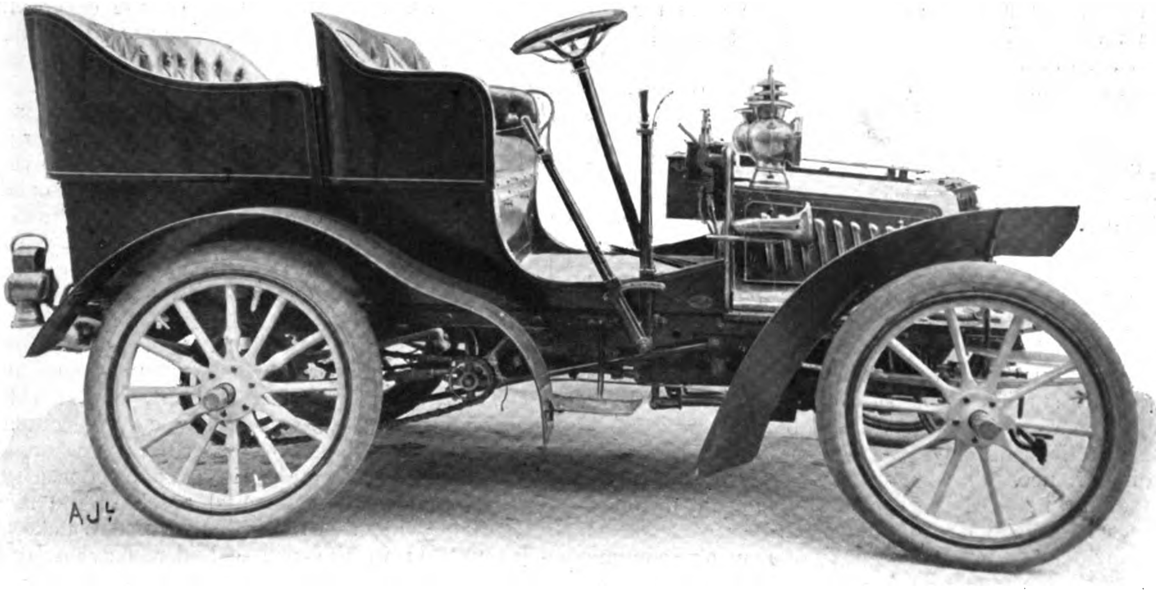


Fig 1.—Side view of 1c-h.p. Chenard and Walcker Car.

Now that the majority of manufacturers of petrol cars have adopted designs which are more or less uniform so far as general features are concerned, it is not always easy, when dealing with new models, to make our descriptions of them of interest and utility to the experienced automobilist as well as to the novice who has only just taken up the sport. The improvements which are made nowadays are naturally of a more detailed character than in the past, so that, on the one hand, those who are unacquainted with automobile mechanism are unable to realise their value, and on the other hand, those who are capable of doing so are liable to overlook them. Even in those instances in which novel features of importance have been introduced, there is necessarily a good deal of informa-

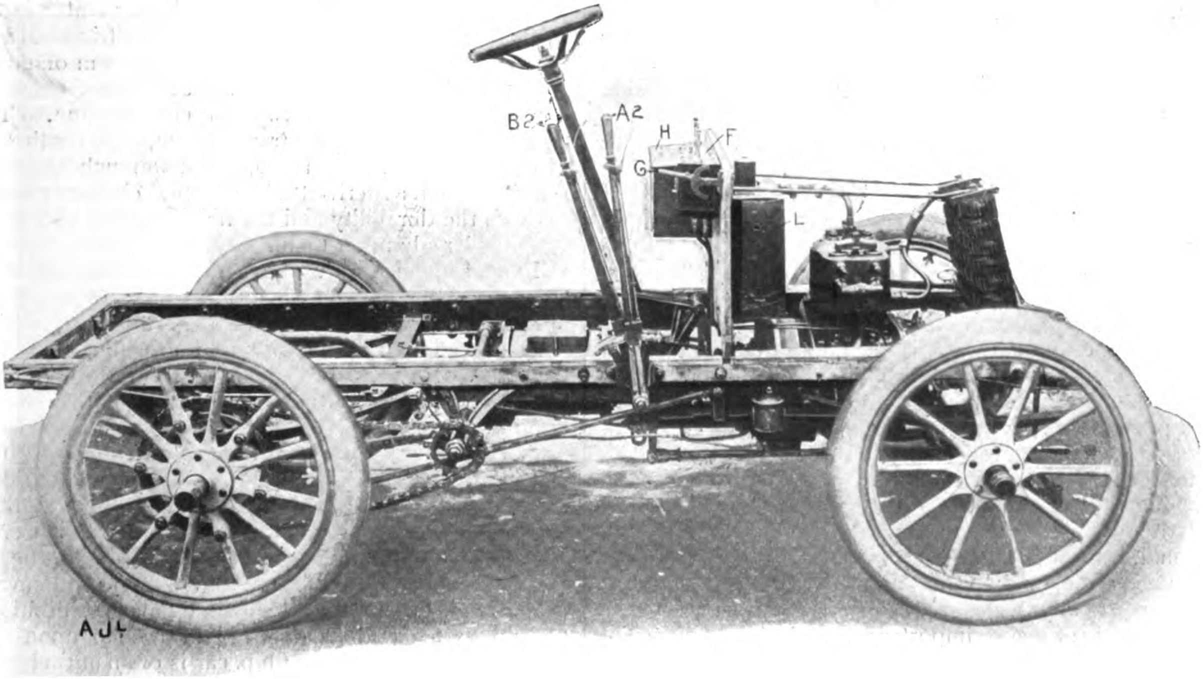


Fig. 2.—Side view of 10-h.p. Chenard and Walcker Chassis.

tion which is required by the general public, but which is recognised as common practice by the connoisseur. In order, however, to enable the latter class of reader to ascertain how far a new make of vehicle calls for his attention, and with the object of saving him as much time as possible, it will have been noticed that we make a rule of summarising the interesting features of the cars which we describe before entering into details concerning them. The Chenard and Walcker cars, with which we are now about to deal, can hardly fail to appeal to the general purchasing public amongst the well-established models, and a description of their general construction will therefore be found useful. They can, unquestionably, be also put into the category of vehicles having features of novelty interesting to the expert, to whom a consideration of these characteristies is important. We therefore follow our usual custom, and shall endeavour to make our article appeal to both classes of reader.

The manufacturers of the Chenard and Walcker cars have evidently studied their subject carefully, and have made a very praiseworthy attempt to obtain improvements in those directions which are recognised as being of greatest importance. Their special system of governing, which not only involves the use of mechanically-operated inlet valves but which derives additional advantages from their employment—aims at simplicity of control, economy of fuel, silence of running, and flexibility of engine in the matter of power and speed. It consists essentially of varying the time during the suction stroke of the engine at which the inlet valve is allowed to close, and of therefore regulating—not the richness—but the quantity of mixture which is drawn into the working cylinder. Simplicity of control is secured because it is unnecessary for the driver to compensate for variations in the richness of the mixture produced in the carburettor. The fuel is economised because the richness of the mixture remains practically constant, and the degree of compression and extent of expansion alone change. It is the increased expansion on light loads which renders the exhaust gases more silent, and it is the reduction of explosion pressures in the working cylinder that tends to reduce vibration. The flexibility of the engine is increased because the reduced compression on light loads enables it to run slower, and because the minimum quantity of mixture admitted to the cylinder gives a feeble impulse at each firing stroke.

Another point is that the engine can be started with less effort owing to the lower compression which obtains at that time; being wedge-shaped, the tendency is for the cam to travel along and for its early-closing end to come beneath the inlet-valve-spindle, with the result that a comparatively small volume of mixture is admitted to the cylinder. Although the time of ignition is fixed, and the spark always occurs slightly before the dead-centre, the low compression renders the mixture slow-firing, and consequently precludes risk of pre-ignition.

A single hand lever is fitted for regulating the engine, and this acts upon the governing system only. The time of ignition is fixed once and for all when the vehicle leaves the maker's works, for although additional advantages might be obtained by retarding or advancing the ignition in order to suit the conditions prevailing at any time, yet simplicity of control has been deemed of more importance, and the makers are probably well advised in their decision on this point.

Another striking feature of the Chenard and Walcker engines is that a single coil is used for both cylinders, and that a spark occurs simultaneously in both. The high tension current is led to the insulated terminal of the one plug, and the other high tension pole of the coil is connected to the insulated portion of the other plug. The spark, therefore, jumps across inside the one cylinder to the cylinder casting, and the current then finds its way across the other plug back to the coil. The object of this arrangement is to ensure that the time of ignition in the two cylinders correspond absolutely with one another; although the one spark only at a time ignites an explosive mixture, yet the idle spark takes place harmlessly in the other cylinder. By this arrangement only one coil instead of two is required, and even though slightly more current may be used the difference is immaterial.

It is particularly interesting to notice that this arrangement of the two plugs in series, gives very much the same effect that is obtained by providing an external spark gap for a high tension plug connected up in the usual manner. The Panhard Company have recently established the fact —which, by the way, is in accordance with electrical practice —that the presence of oil or other impurities on the spark points of an ignition plug is rendered considerably less detrimental if such an external break in the high-tension circuit is provided. In the Chenard and Walcker case, the ignition plug in the one cylinder may apparently be regarded as an external spark gap for the igniting plug in the other cylinder, and it is quite conceivable, therefore, that surer ignition is secured in addition to the already mentioned object which the makers originally had in view.

Simplicity of parts combined with accessibility has been aimed at throughout, and the success which has been met with can be judged from the general description which follows. The combined clutch and foot-brake is the most notable instance of this, the moving clutch member being made to serve the double duty of engaging with a clutch shell in its one position, and of coming into contact with a fixed brake-ring in its other position. The transmission gear has been so arranged as to absorb as little energy as possible, and it is owing to low frictional losses in the transmission, combined with the system of governing, that the Chenard and Walcker cars have been able to establish a record for low fuel consumption. The importance of efficiency of transmission, and, for that matter, of low fuel consumption also, is not so much owing to the direct benefits derived from these characteristics, but because the durability and the noiselessness of the vehicle depends largely upon them.

In consequence of the above-mentioned features these cars are remarkable for their silence when the engine is running and the car standing still, for their absence of vibration when travelling, for the slow speed at which they can run on the top gear, and for their power of starting from rest on the third speed. When running light the engine will continue to revolve, even if slowed down to less than 100 revolutions per minute, although the flywheel provided is of normal weight. The manufacturers have already placed two distinct types upon the market, one having a 1 -h.p. engine, and the other a similar engine of 14-h.p. None of the larger cars have, up to the time of writing, reached this country, although one of them will, we understand, be shown at the Crystal Palace Exhibition. The general systems above referred to are common to both vehicles, although the 14-h.p. car is of an entirely different type, so far as the transmission gear is concerned. A longitudinal propeller-shaft connects its change-speed

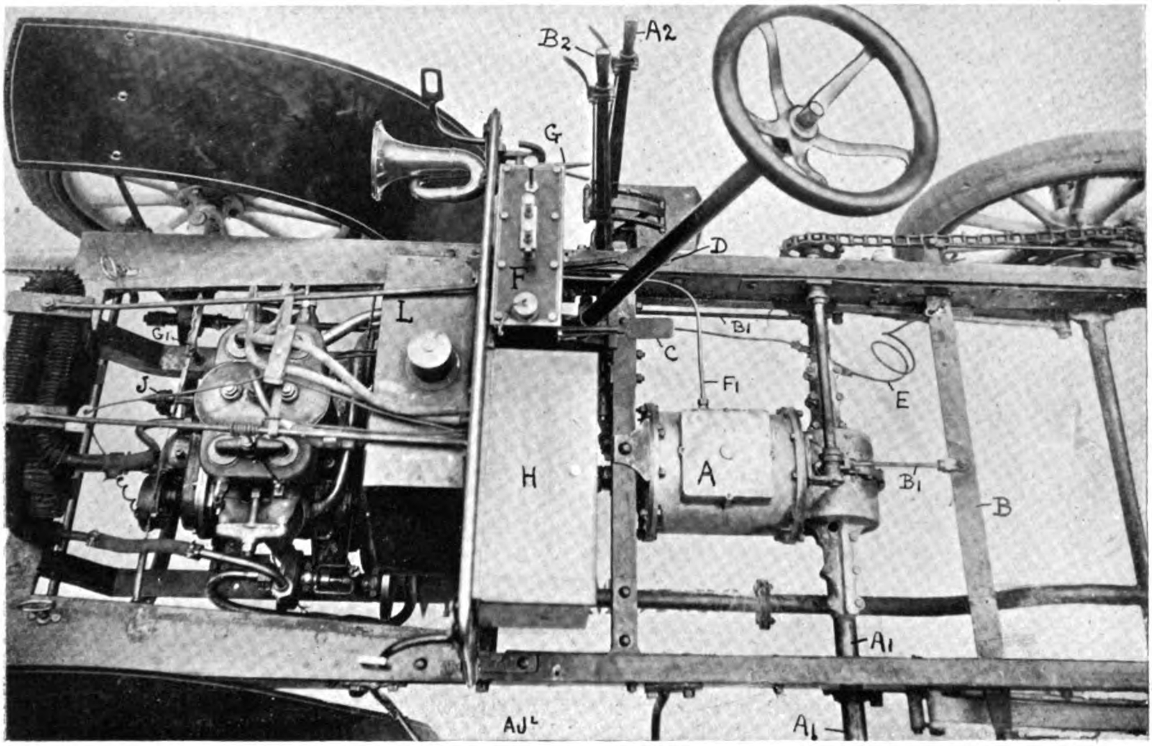


FIG. 3.—Photographic view of Chassis from above.

gear through bevel gearing with a transverse differential shaft mounted about the rear axle. The rear wheels are driven by pinions on the ends of the transverse shaft which mesh with internal gear-wheels fixed to the hubs. We propose, however, to defer any detailed description of this vehicle until after we have made a thorough inspection of it, and have tried it.

The first of the 10-h.p. vehicles arrived in England recently, when we were afforded every opportunity for making a complete inspection of it, and for giving it a thorough practical trial. Its general appearance is seen in Fig. 1 and in our frontispiece. The chassis is represented in Figs. 2, 3, and 4.

The main frame, which is rectangular, is constructed of wood and is stiffened with steel flitch plates lying along the inner face of the side members. It is provided with a short underframe of angle section steel, which supports the engine in the usual position in front. The frame is suspended by long and flat semi-elliptic springs above the front and rear axles, and the rear axle is also connected with the frame by pivoted distance rods which enables the tightness of the driving-chains to be adjusted. The wheels are of the artillery type, and are of equal size. They are shod with extra strong Clipper-Michelin tyres, and the wheel base is about 6 feet 3 inches. The steering gear is of the wheel type, with irreversible worm and worm-wheel. The steering pillar is perfectly plain, and does not carry any regulating levers. The hubs of the rear wheels are provided with brake-drums of large diameter and width, around which double-acting brake-bands are fitted. The rods actuating the brakes are attached to either end of a cross-beam, B (Fig. 3), which is free to slide in horizontal slots in the frame. The brake-lever, B^2, is connected by rods, B^1, in the manner seen in the drawing, with the centre of the beam, B, so that it is drawn forward by the driver when he applies the brake. The beam, B, constitutes a compensating device which ensures an equal pull being exerted on both brake-bands.

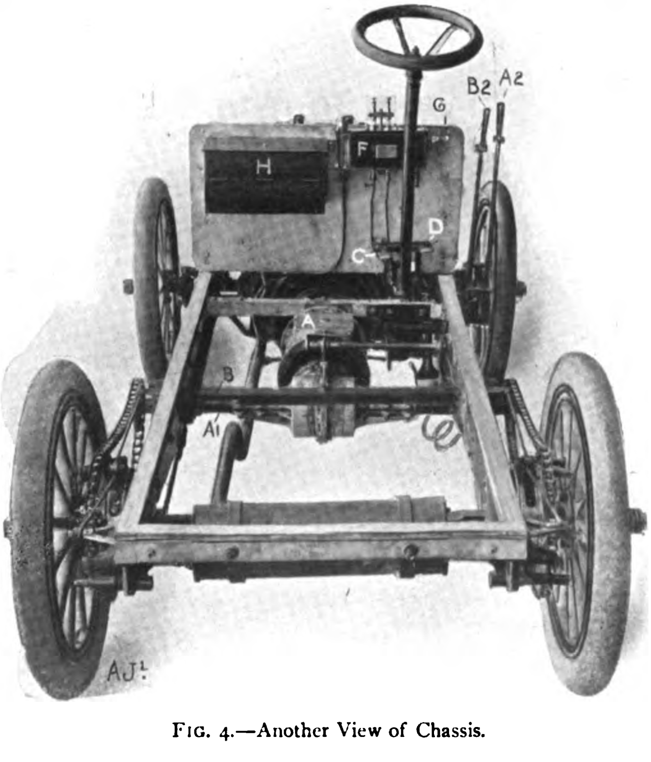
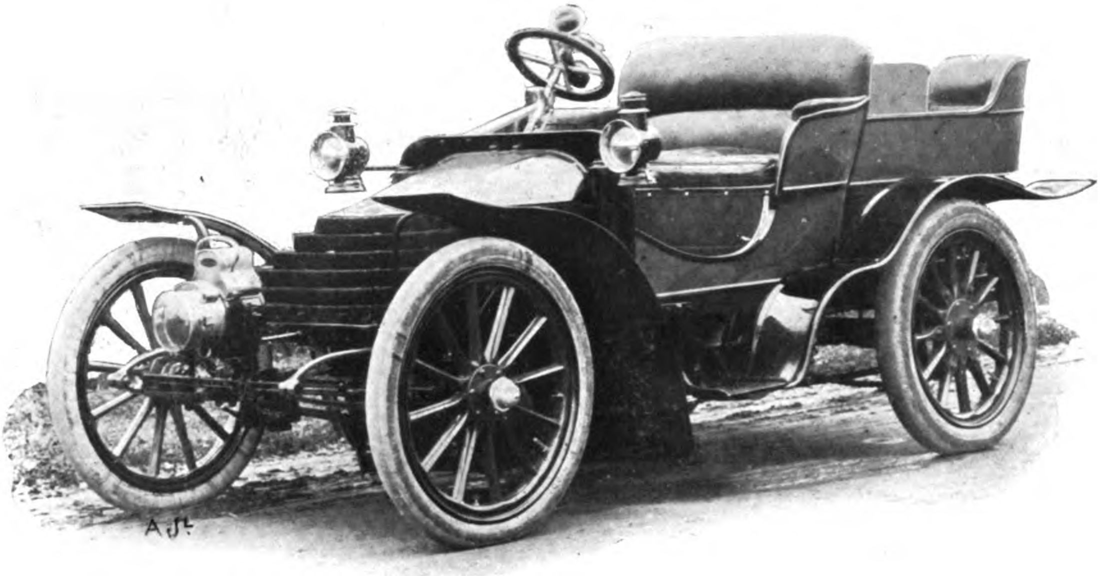


FIG. 4.—Another View of Chassis.

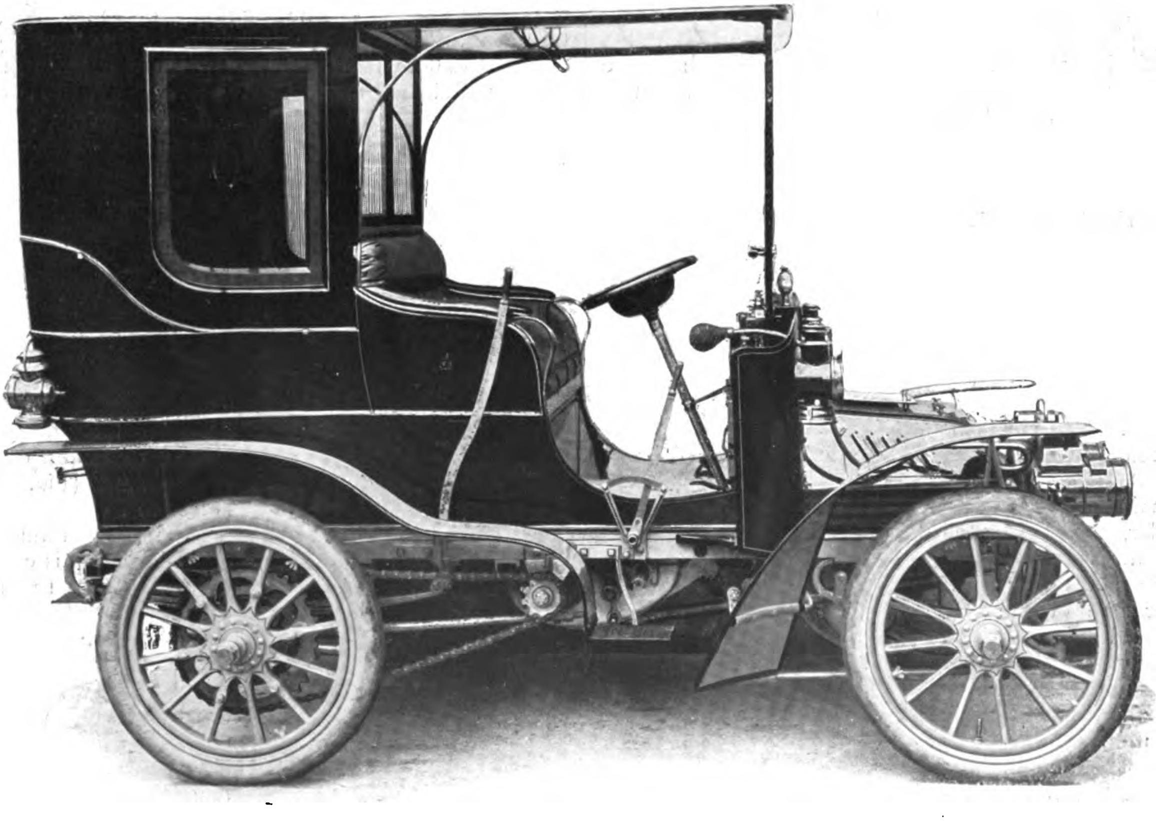
(*To be continued.*)

THE AUTOMOBILE SHOW AT THE CRYSTAL PALACE—A FORECAST.

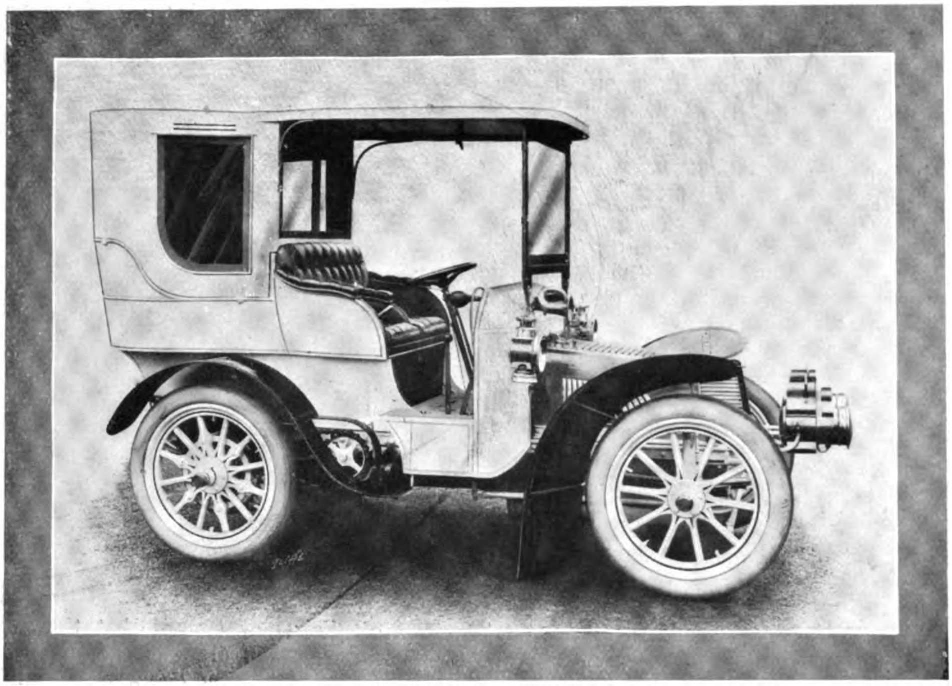


30-h.p. Wolseley Touring Tonneau.

WHEN these lines reach the hands of the majority of our readers the great Automobile Exhibition at the Crystal Palace will have been thrown open to the public. It remains open until Saturday, February 7th, and from information already to hand, it is evident that a very large number of the leading automobile firms in this country will be well represented. We understand that visitors to the Show, who wish to see everything, will have to walk nearly

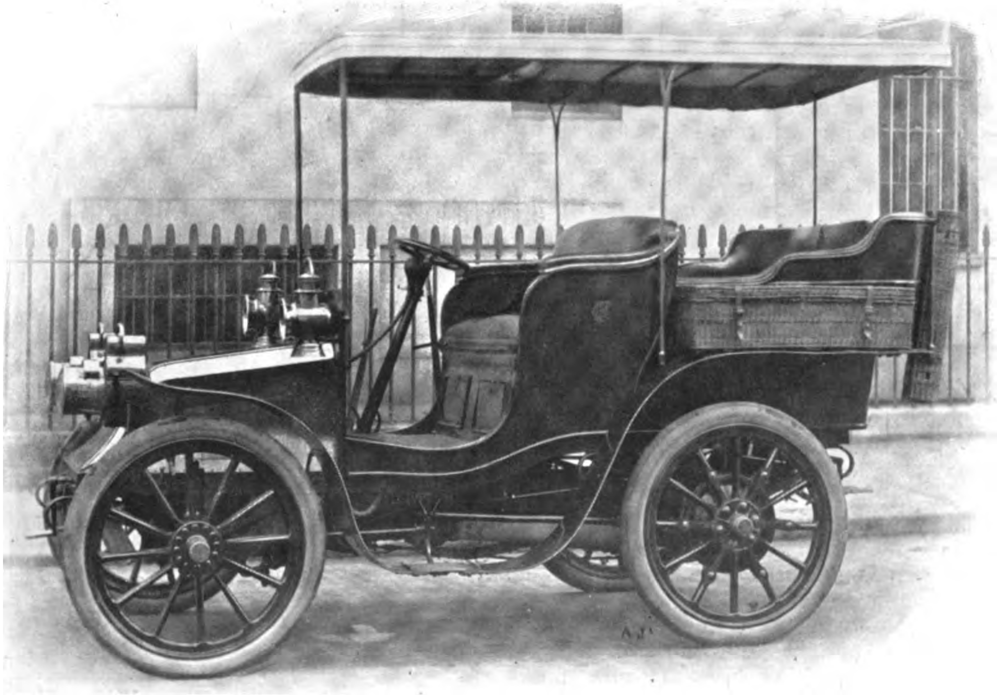


One of the latest Brooke Cars.

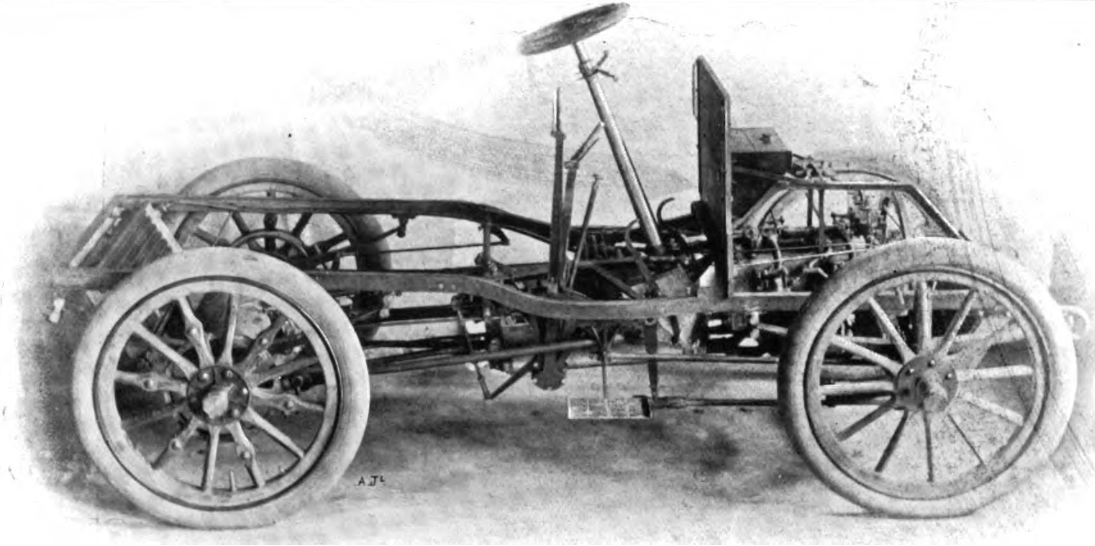


A 22-h.p. Daimler Car.

our miles, if only to pass all the stands in the building. Considering also that a large number of exhibitors are arranging to demonstrate the capabilities of their cars in the grounds, anything like an exhaustive inspection of all that is to be seen there is well-nigh impossible in a single day. The Crystal Palace is by far the most suitable place in which to hold such an exhibition in the neighbourhood of London, in spite of its position being rendered somewhat inconvenient by the railway "facilities" which exist; the management have, however, arranged a garage in which visitors by road can leave their cars, and doubtless this will be made use of to a considerable extent. The normal appearance of the main building has seldom been so thoroughly altered as on this occasion. The whole transept is



The Wilson and Pilcher 10-h.p. Tonneau with Canopy.



The Wilson and Pilcher 10-h.p. Chassis.

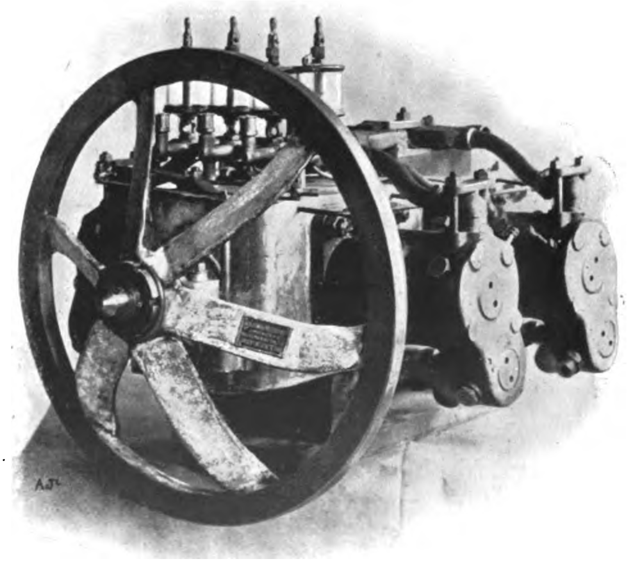
occupied by stalls, and many of its well-known features have necessarily been temporarily removed.

Although it is impossible for us this week to give anything like a complete forecast of the exhibits, or to refer to the many interesting new models which will be on view, yet many of the leading makers have supplied us with information concerning their latest productions. In our next issue we intend to give a thorough description of the Show, but we believe that many of those who anticipate journeying to the Palace will be interested in having some particulars in advance.

It is safe to say that a large number of British-built cars will be shown, and that the 1903 models will possess many improvements, and even features of novelty, compared with those of last year. The Show will, moreover, be at least representative of the automobile industry, as far as variety of type is concerned. Of petrol-driven vehicles, every kind, from the high-powered racer down to bicycles fitted with motors, will be on view. In the way of steam-driven vehicles, heavy lurries will be prominent, in addition to cars of the light American type and of the more substantial and heavier private carriages. At least one car fitted with a combined petrol and electric system will be on view, and electrically propelled cars, both for private use and for industrial purposes, will be shown. Needless to state, all the leading tyre manufacturers and the many large concerns which deal in accessories for motorists will be strongly to the fore. The following brief information concerning some of the exhibits will doubtless be found useful, and will enable those who have not too much time at their disposal to make sure of seeing some of the cars which are likely to appeal to them.

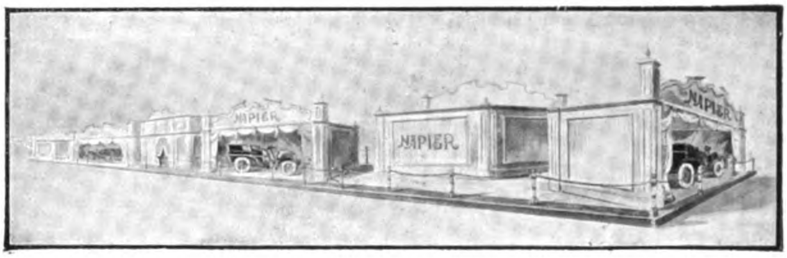
Petrol Cars.

The Daimler Company have this year standardised two types of car, both of which are fitted with 4-cylinder motors. The one car has a 22-h.p. engine, and the other an engine of 14-h.p. Amongst improvements which have been made is the elimination of the underframe, the detachability of the base of the crank-chamber, and the increased length of wheel base. Electric ignition alone is now fitted, unless otherwise ordered, and the circulating pump is driven by a chain instead of by friction. Another feature of their new cars is that the hand-brake is independent of the main clutch, so that the driver can take advantage of the braking effect of the engine at the same time that the emergency brakes are applied. The countershaft sprockets are mounted in such a manner as to be easily changed. The bodies are hinged to the frame at the rear, and can be tipped up to facilitate inspection of the mechanism. The Company will probably show the 12-h.p. car of their make which has been used by His Majesty the King, and they are also exhibiting a wagonette made to the order of His Majesty. This latter vehicle has a 10-ft. wheel base, and is of the 22-h.p. type. The rear portion accommodates eight passengers, and is sufficiently roomy for eleven if necessary. Another of their 22-h.p. cars is built on the lines of Baron de Zuylen's Paris-Berlin car, and a 14-h.p. vehicle with a Limousine body.



The Wilson and Pilcher 10-h.p. Balanced Engine.

The Wolseley Company promise no less than 19 cars, ranging from a three-seated 5-h.p. vehicle, to a chassis for a 50-h.p. racer. Many of their standard bodies are shown fitted to the different machines, and some new forms will also be in evidence. Their most noticeable exhibits will be a 30-h.p. touring tonneau (see illustration)—said to be extremely fast—a 22-h.p. omnibus, and two 10-h.p. vehicles—the one a landaulette in which access can be had to the rear seats from in front, and the other a Siamese phæton, having glass weather screens. One of the Company's 45-h.p. racing cars is being shown, and their 50-h.p. chassis should be particularly interesting in consequence of its pressed nickel-steel main-frame.

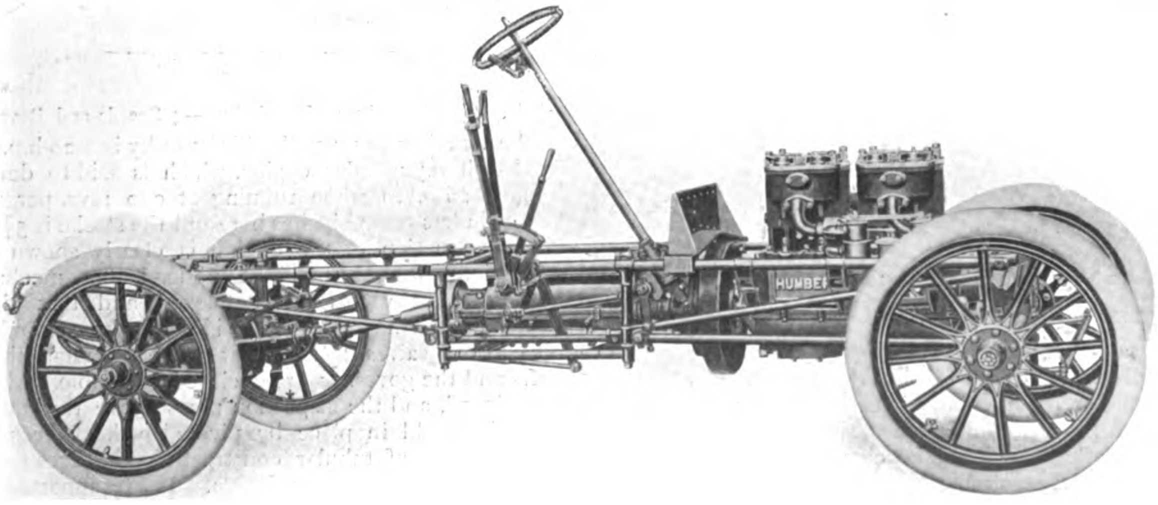

The Napier Exhibits in their Glass-houses.

S. F. Edge, Limited, are making a particularly fine show with their well-known Napier cars, the arrangement of their stall alone being sufficient to attract considerable attention. Each of the vehicles is enclosed in a separate little glass-house to itself. Another exhibit which is sure to appeal to the majority of visitors is the famous racing car upon which the Gordon-Bennett Cup was won for England in last year's race. The chief improvements which have been made this year consist in the construction of the steering gear in such a way that any wear can be taken up, in the employment of a ball thrust bearing behind the main bevel, and in the use of a new circulating pump. Their new 12-h.p. model, which we have fully described and illustrated recently, is represented by two complete vehicles and by a chassis. One of the cars was shown in Paris at the Salon, where the company were awarded a gold medal. Striking examples of their 16-h.p. and 20-h.p. vehicles are also exhibited, amongst which are cars specially built for Mr. Lionel de Rothschild and the Right Hon. A. J. Balfour.

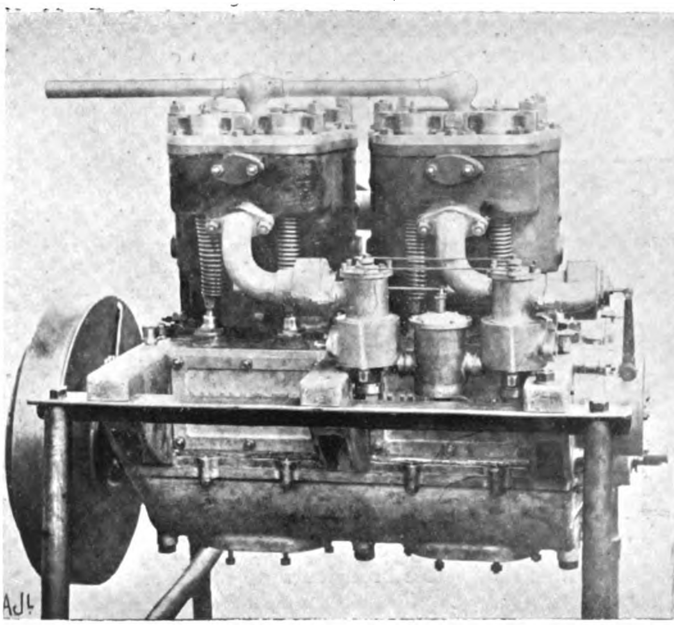
Amongst other English companies showing well-known cars are the Motor Manufacturing Company, Messrs. James and Brown, Messrs. J. W. Brooke and Co. (one of whose cars we illustrate), the New Orleans Company, and Messrs. Marshall and Co., of Manchester.

The Ariel Motor Company are showing two cars of each of their two types, as also a chassis of each. These vehicles have undergone some little improvement in details since we described them fully in our issue of September 20th, 27th, and October 4th, 1902, last. Both the 16-h.p. and 10-h.p. machines are given a greater length of wheel base, and the latter vehicle now has a speed-gear giving four forward speeds instead of three. The Company are showing a special 16-h.p. double tonneau, which they have built for Major Kingsley Foster, J.P., of Redhill. It has seating capacity for seven people, is provided with a detachable brougham top, and is electrically lighted.

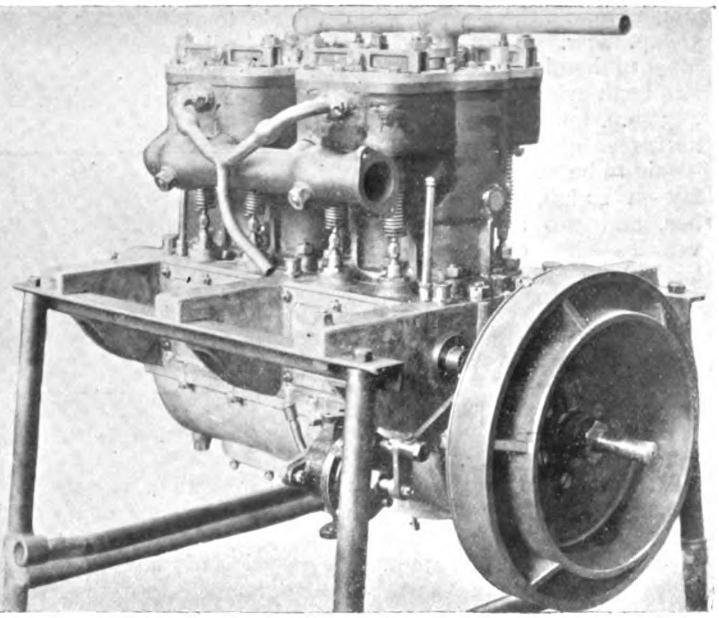
Messrs. Wilson and Pilcher are introducing a new 10-h.p. model of their unusually silent cars, which replaces their previous 8-h.p. type. The main difference in construction is that the change-speed-gear and the engine, although rigid with one another, are separate from the casing surrounding the live axle. The power is transmitted from the change-gear by a universally-jointed longitudinal shaft, and the rear axle is connected with the main frame by distance rods at each side, and by the usual semi-elliptical springs. The engine remains practically unaltered; it and the gear-box are centrally pivoted at two points to the main frame; it is also connected with the frame by light hangers with springs. The gear-box is attached to the live-axle casing by pivoted and forked distance-rods both above and below the longitudinal shaft. Many minor improvements have also been made, one being that a single side lever is now used for operating the gear. One of our illustrations shows a 6-seated tonneau fitted with a canopy, and the manufacturers are also exhibiting another car which has a 5-seated tonneau body. One of their special



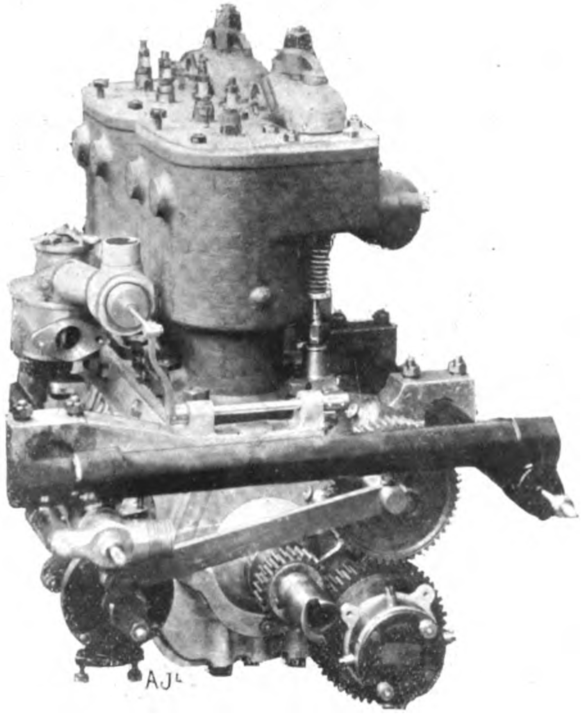
The 20-h.p. Humber Chassis.—Fitted with mechanical inlet-valves.



20-h.p. Humber Engine—Inlet-Valve Side.

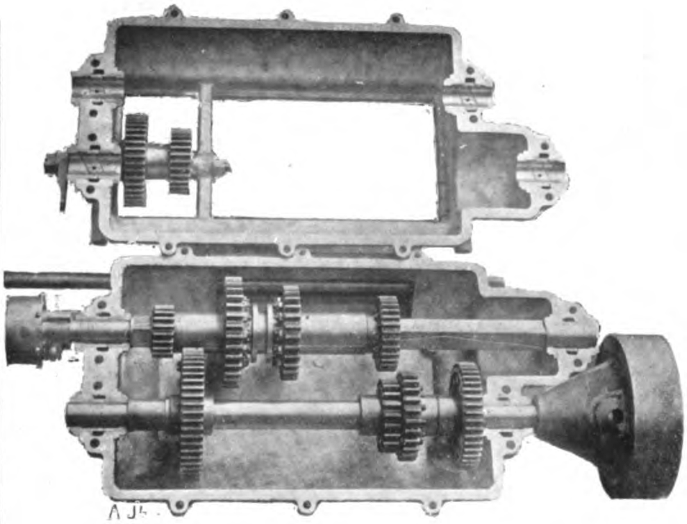


20-h.p. Humber Engine—Exhaust-Valve Side.



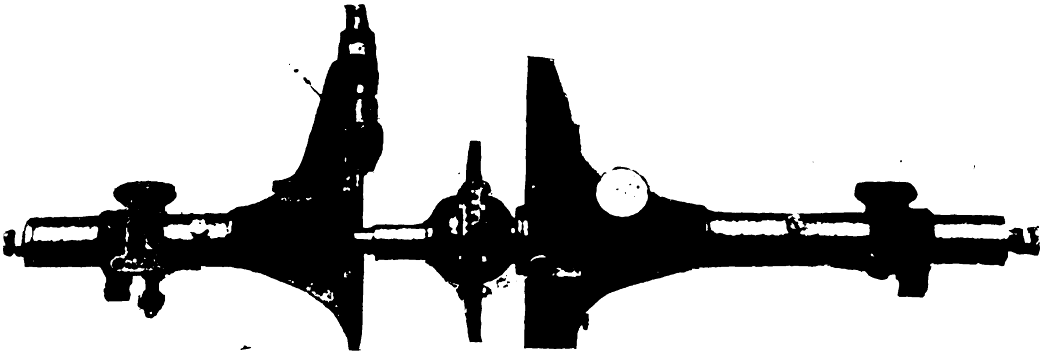
12-h.p. Humber Engine—1903 Type.

engines, of which we reproduce a photograph, is being shown separately, as also are samples of various patented parts. Those who are interested in the question of electric ignition should make a point of seeing the apparatus employed on the 1903 cars in which a single trembler serves for the four sparking coils. The commutator in this case completes the electric circuit between the battery and the trembler through each coil alternately, and greater synchronism in all four cylinders is thus ensured.



The Humber Change-Speed Gear—4 Speeds and Reverse.

The Humber Company's chief novelty is a 20-h.p. vehicle fitted with a 4-cylinder engine, which is said to develop as much as 26 b.h.p. when running at 900 revs. per minute. The cylinders are $4\frac{1}{4}$ inches bore and the stroke is $5\frac{3}{4}$ inches. The construction of the engine is clearly shown in our illustrations, where it will be noticed that mechanically operated inlet valves are employed, and that they are arranged on the opposite side of the cylinders to the exhaust valves. The gear wheels driving the camshafts and the governor are enclosed, a double carburettor is employed, and the inspection plugs above the valves are removably held in place by pivoted yoke pieces. The main frame is of tubular construction, and does not differ materially from last year's design. It is supported above the front axle on a transverse spring, and the usual semi-elliptical springs are employed behind. The wheel base is



The Humber Live Rear Axle—Showing Differential and Bevel Gear.

9 feet 6 inches, the track 4 feet 3 inches, and the car weighs about 21 cwt. We give an illustration of the chassis. The 12-h.p. car does not differ materially from last year's type except that the engine has been remodelled, the frame lengthened, the compression increased, and that the details of suspension are altered somewhat. The cylinder bore is 3½ inches and the stroke is 3⅝; the automatic governor regulates the speed by means of a throttle valve.

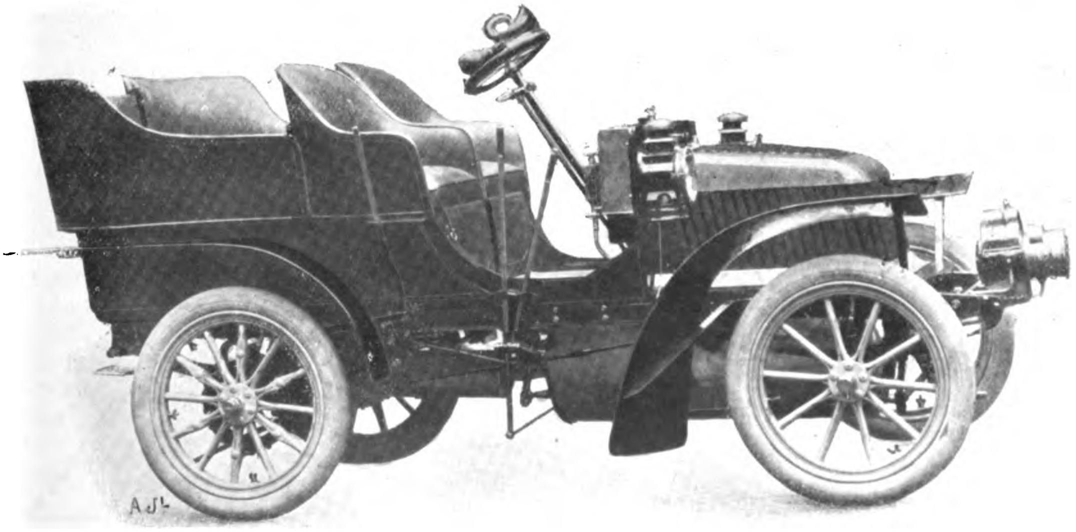
The Velox Company's new car, which has been so fully described by us recently, is exhibited by the makers.

The Brush Company are showing a 20-h.p. chassis, in which mechanical inlet valves, a honeycomb cooler, and forced lubrication are employed. They will also stage a 16-h.p. diligence, which has a new form of body, practically combining two or three distinct carriages in one. The Company have given considerable attention to the question of bodies, and have succeeded in producing some remarkably comfortable and convenient forms. They show a 16-h.p. Limousine, which they have built for Major-Gen. Arthur Paget, and a 12-h.p. tonneau-de-luxe with 4-cylinder motor. Another of their 12-h.p. cars has an engine with mechanical inlet valves; and yet another vehicle is one of their standard twin-cylinder tonneaus.

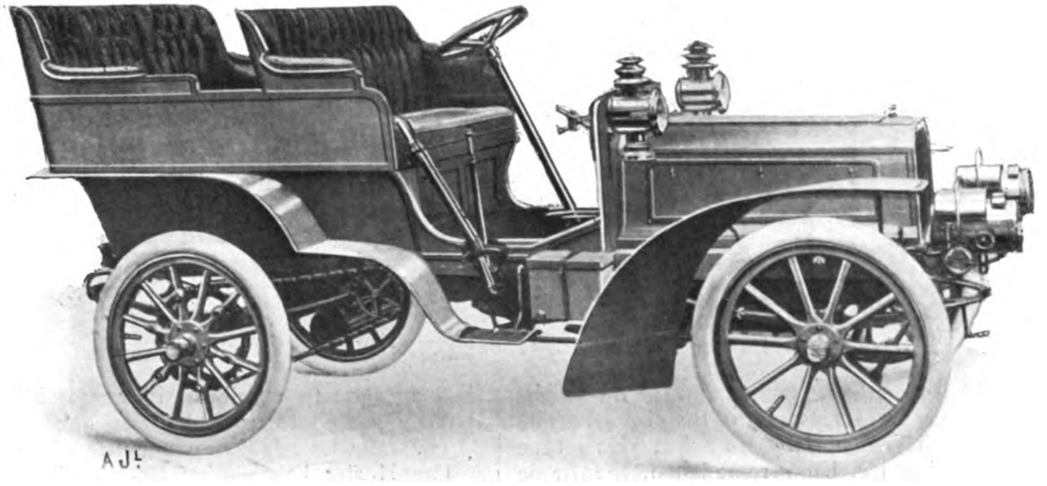
The Maudslay Motor Company will be represented by a 20-h.p. 3-cylinder chassis. The engine has mechanical inlet valves, and a fan-cooled radiator is fitted. The frame of this machine is of extra length. They will also show a wagonette omnibus with removable top, a standard tonneau geared to 40 miles per hour at normal engine speed, and a Lonsdale Wagonette, lent by its owner.

The Hozier Engineering Company's new 10-h.p. 1903 model, of which two samples are shown, is fitted with a 2-cylinder Clement engine. They are also showing a chassis fitted with a 9-h.p. De Dion motor. The chief features of their cars are a self-adjusting friction clutch, gear wheels of increased size, and a flexible lever for operating the fork which brings the second and third speeds into play. The hand lever controlling the change gears moves in three different directions for the three forward speeds—outwards, towards the driver's seat, and forward. The gear-box is so made that the lid can be taken off in a few moments and the gear-shaft lifted out. A separate lever is fitted for the reverse. Natural circulation is, as a rule, adhered to, but a pump is fitted when required. The entire mechanism is encased beneath, and roller bearings are fitted to the rear axle.

One of the most notable exhibits will be the new petrol cars which are being made by the Thornycroft Steam Wagon Company, for the design of which it is understood that Sir John Thornycroft himself is to a great extent responsible. They are being made in two sizes, the 10-h.p. car having a 2-cylinder motor, and the 20-h.p. size a 4-cylinder motor. A 10-h.p. finished car and a 20-h.p. chassis will be shown. Amongst other interesting features,



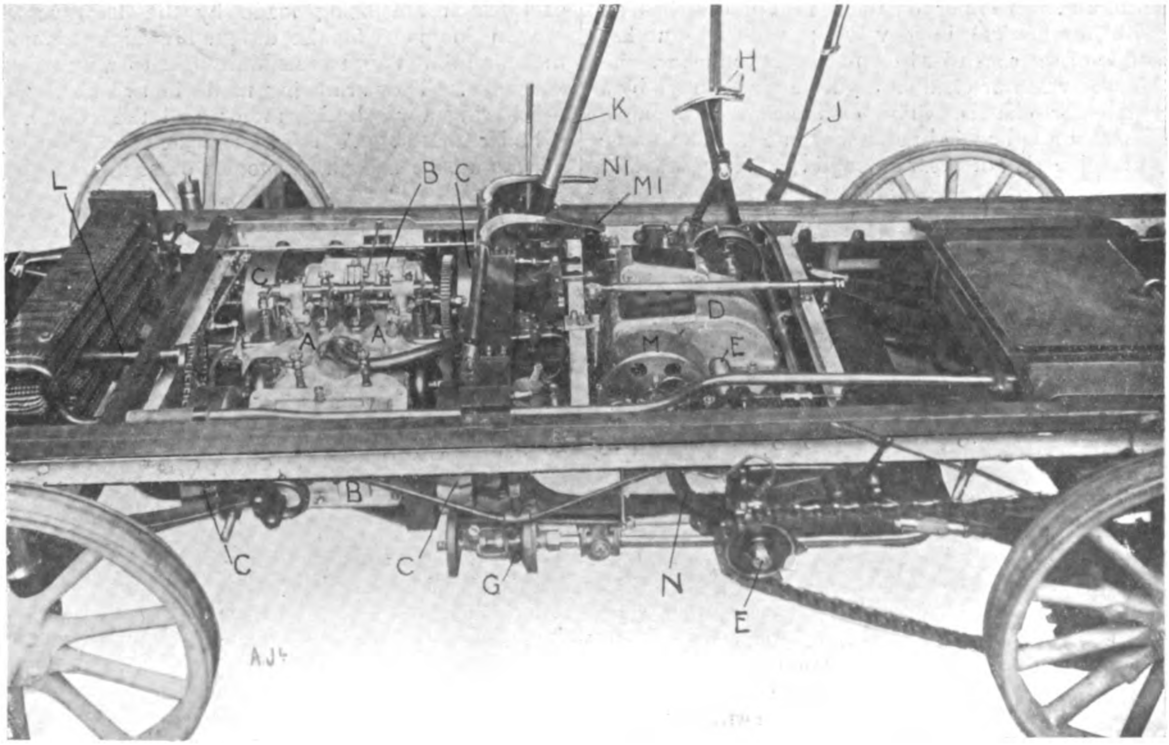
10-h.p. Twin-Cylinder Hozier Tonneau.



The 16-h.p. 4-cylinder Gladiator Car—fitted with mechanical inlet valves.

the electric ignition system adopted is somewhat novel, an automatically controlled dynamo being employed in such a manner as to keep the accumulators charged. This well-known Company have also taken up the question of utilising internal combustion engines working with kerosene as fuel, and are building a 5-ton lurry fitted with one of these. We believe that a 2-cylinder engine of this type, and one with four cylinders, developing 45-h.p., are to be shown.

At least two other firms, Messrs. Dennis, of Guildford, and the Albion Motor Car Company, of Glasgow, are showing cars in which a flexible spring drive is employed in somewhat the same manner as in the Velox car. The Albion Company's exhibit will consist of one of the 12-h.p. tonneaus which was described by us in our issue of January 3rd, a 10-h.p. chassis and a 10-h.p. tonneau-de-luxe for five. Messrs. Dennis will have three 12-h.p. cars fitted with twin-cylinder De Dion motors, two 9-h.p. single-cylinder vehicles, and a 4-cylinder chassis with a slow-running Aster engine giving from 16 to 20-h.p. The Star Engineering Company, the Rex Motor Manufacturing Company, the Beaufort Motor Company, the Century Engineering Company, and the Gainsborough Motor Company, will also be exhibiting



The 12-h.p. Bardon Chassis.

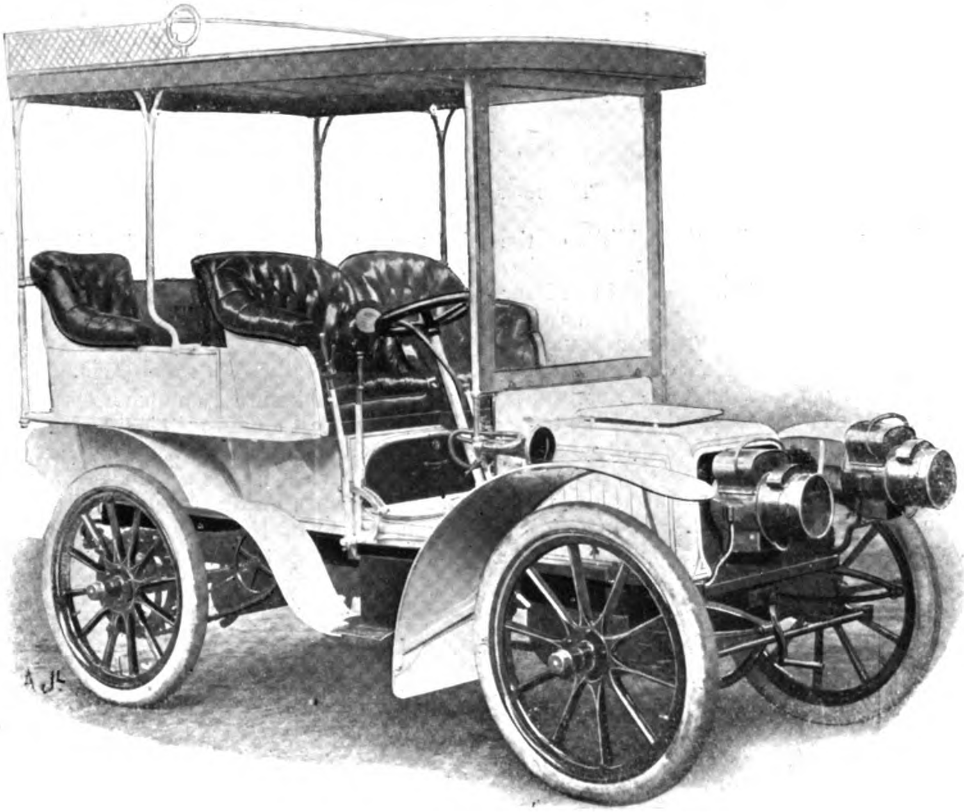
their latest productions. Amongst new makers who have taken up the construction of automobiles, the Eagle Engineering Company and the Elswick Motor Company will be represented, and their models will doubtless be examined critically.

Most of the best-known Continental makers will be well in evidence at the Show, and the stalls of the English agents will contain the latest models. The Panhard and Levassor Company are to have the handsome stand which was used at the Paris Salon, and will be showing some thirteen cars in all. Their special features will be a new 20-h.p. vehicle and the Krebbs carburettor. This device will be shown working on a 15-h.p. engine and will also be fitted to Messrs. George and William du Cros' cars in the grounds.

Milnes-Daimler (Limited) will show a great variety of automobiles manufactured by the German Daimler Company of Cannstatt. The public will be given an opportunity of admiring the workmanship of the De Dietrich cars. The new Gladiator models will be shown on a separate stall by Messrs. S. F. Edge (Limited). The new 4-cylinder vehicles will be found especially interesting. The stall will have the same decorated sign which gained a gold medal in the Paris Salon. The De Dion Company's models, which we described recently, will be on view, and the New Automobile Company will again show the latest Rochet types.

Messrs. Mann and Overton promise a 20-h.p. Mercedes-Simplex car, in addition to a 12-h.p. Georges Richard chassis of latest type, and a 10-h.p. Georges Richard light tonneau. The Renault and Mors productions enable the Roadway Autocar Company to make a very attractive show, and the Renault racer which won the Paris-Vienna race will be shown.

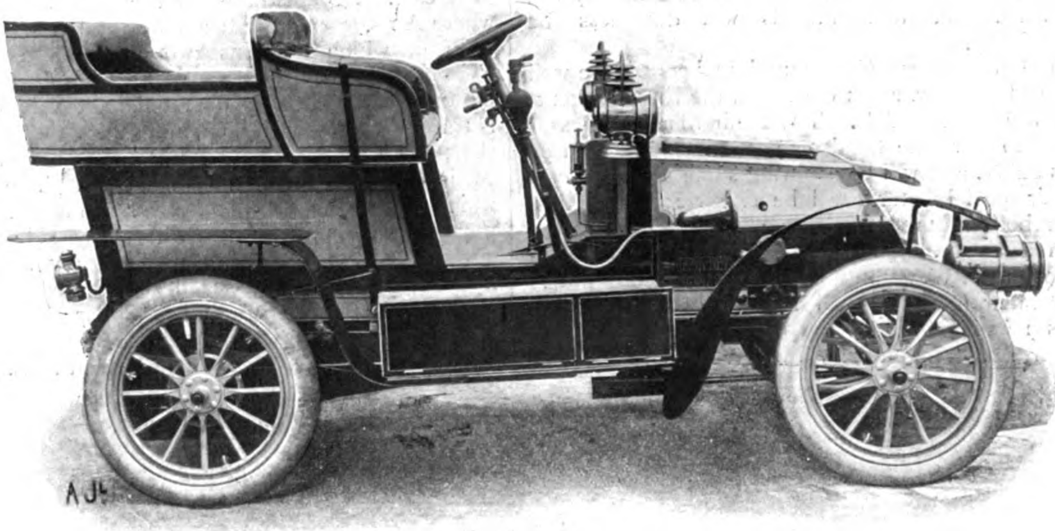
The Auto Carriage Company are showing a twelve h.p. 1902 type Bardon chassis, together with three complete cars. An illustration of the chassis is given herewith, where A represents the two horizontal transverse cylinders, each of which contains two pistons. The two crank-chambers are marked B, and the four flywheels, C. The motor has mechanically operated inlet valves. The power is transmitted from both crank-shafts to the first-motion-shaft of the change-speed gear, D. The main friction clutch, M, is operated by the foot pedal, M¹. The countershaft, which carries the band-brake, N, connected with the foot-pedal, N¹, drives the rear wheels by side chains. The circulating pump, G, is driven frictionally from one of the flywheels. The change-speed gear is operated by a single lever, H, and the rear brakes, which are compensated, are applied by a second side lever, J. The steering pillar is seen at K, and the starting handle shaft at L.



Lord Dalmeny's Coming of Age 10-h.p. Panhard—Supplied by C. S. Rolls and Co.

Messrs. Chenard and Walcker's cars, one type of which we deal with in detail this week, are being shown by the English agents—the Weston Motors Syndicate.

An agency for the well-known cars of Charron, Girardot, and Voigt has recently been taken up in this country by Evart Hall, Limited, which Company will be exhibiting some of them at the Show. We would call attention to the Siddeley cars, which are being shown for the first time, and which are uncommonly well-built vehicles. The London Motor Garage Company are exhibiting their "Pipe" and "Magnet" petrol vehicles, and also hope to have an 18-h.p. Mercedes-Simplex on view. The Great Central Garage Company will show their "Earl" vehicles, and a variety of Panhards of various forms will be exhibited by C. S. Rolls and Co.

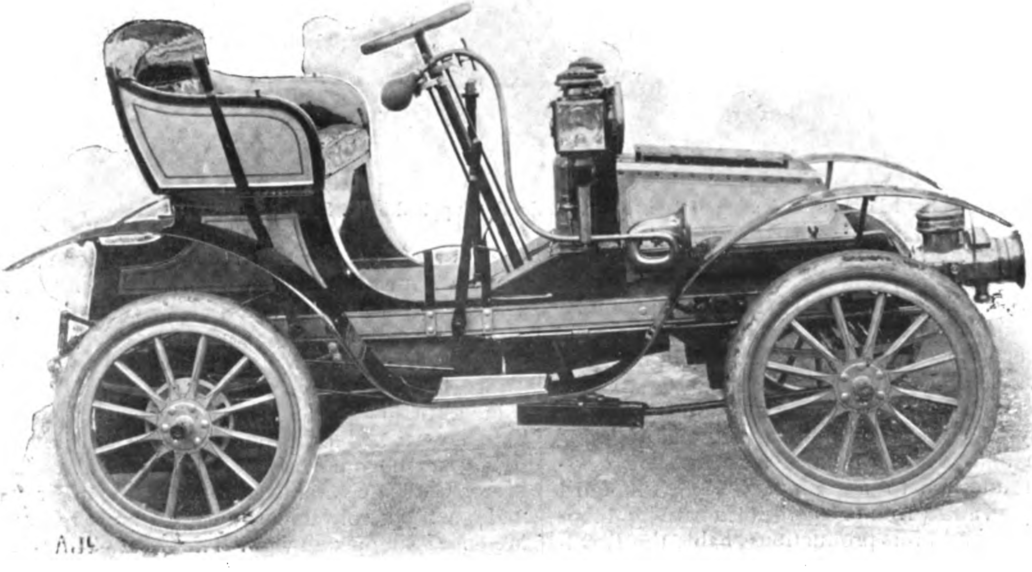


The 10-h.p. Pick Car.

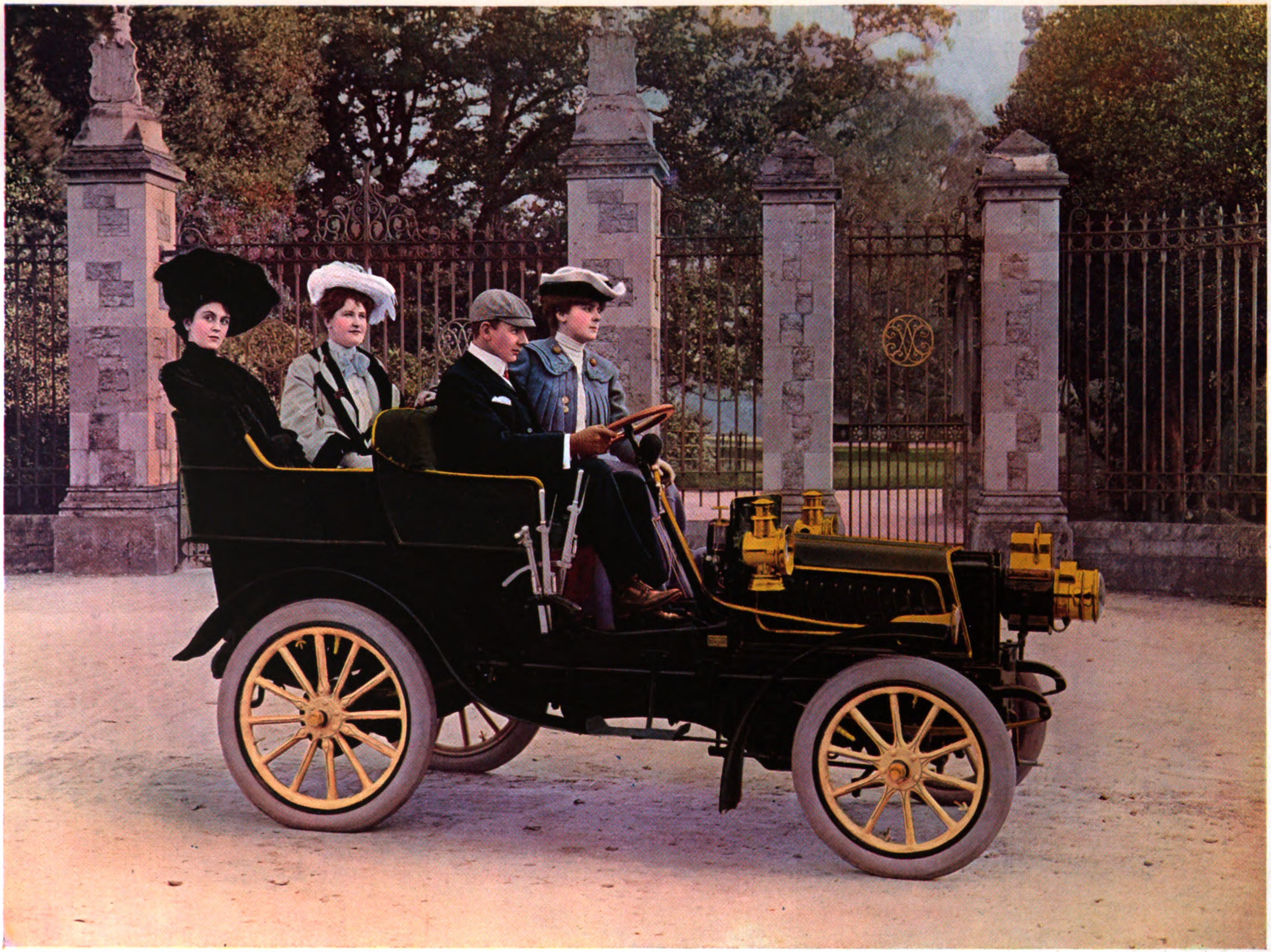
Amongst cars of lighter construction the exhibits of the Progress Company (*see* AUTOMOTOR JOURNAL, December 6th, 1902), Messrs. Pick and Co., the Swift Motor Company (*see* AUTOMOTOR JOURNAL, October 18th, 1902), and Messrs. Alldays and Onions (*see* AUTOMOTOR JOURNAL, November 22nd and 29th, 1902) should be mentioned. The Pick Company will show 6 and 10-h.p. voiturettes, in which balanced horizontal engines are used, and the transmission is effected by enclosed belts. They also have 6 and 10-h.p. cars with a gear type of transmission, the power being taken by a Renold silent chain to the change gear, and by a roller chain from it to a live axle. The Company make a special feature of a cam-brake. The Wartburg light cars will again be shown by Messrs. Haynes and Son. Petrol vehicles of American design will include the well-known Duryea models, the popular little Oldsmobile, and the vehicles for which Messrs. Davis, Allen and Co. have agencies.

Steam Cars.

Several well-known manufacturers of steam lurries will show their latest models. The Thornycroft Steam Wagon Company are showing a 3-ton dray for brewers' use, which carries 15 barrels, and is capable of hauling a trailer with 10 more barrels, making a total load of five tons. Another wagon is one of their standard tipping type, as supplied to many municipal authorities, and an interesting Colonial



The 6-h.p. Pick Voiturette.



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A 10 HORSE POWER DECAUVILLE CAR.

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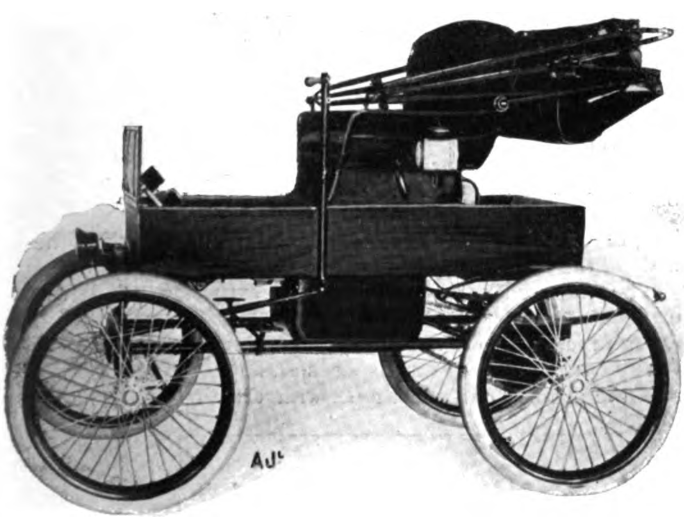
ASTOR, LENOX AND TILDEN FOUNDATIONS.

lurry, which is provided with a specially large boiler for using inferior coal or wood as fuel, will be shown. The Straker Steam Vehicle Company are to show four wagons, one being a five-ton machine with hinged sides, another being their standard five-ton chassis (exposing the machinery to view), a third is a five-ton brewer's wagon intended to take an additional two-ton trailer, and the remaining wagon is constructed for loads of seven tons, in addition to hauling a three-ton trailer. Jesse Ellis and Co. are also exhibiting heavy steam lurries of their manufacture, and one of the Brightmore patent steam wagons is being shown by its inventor.

Steam carriages for private use, built on European lines, will be shown by the following well-known manufacturers:—The Gardner-Serpollet British Company, the Speedwell Motor Company (with their Gardner-Serpollet cars of French manufacture), the New Automobile Company with their Miesse cars, and the Clarkson and Capel Steam Car Syndicate (Limited), with their Chelmsford vehicle, which was described in our issues of November 8th, 15th, and 22nd, last year. The British Gardner-Serpollet Company have made but few alterations in their standard 6 and 12-h.p. models. The Speedwell Company make a special feature of the new 10-h.p. type, and have a 20-h.p. pattern, besides showing the interesting 40-h.p. chassis, which we have previously illustrated, and referred to more than once.



A Baker Electric Runabout.

Of American steam cars, the new White model is sure to attract considerable attention, owing to the European lines on which it is built and to the many improvements which have been made in the method of carrying out the maker's special system. The Locomobile Company's stand should prove interesting, as they are introducing fresh models, some of them of higher power, for the coming season.

The Weston Motors Syndicate have made several alterations in their standard Weston cars, the introduction of a super-heater between the throttle valve and the boiler being the most important. The cars are now fitted with an automatic lubricating pump and with a steam air-pump. A new form of body provides for an extra seat of neat design. Mr. J. D. Sardy will be showing the latest Reading Steam Cars, in which the type of engine employed has been entirely altered, and many other improvements have been made.

Electric Cars.

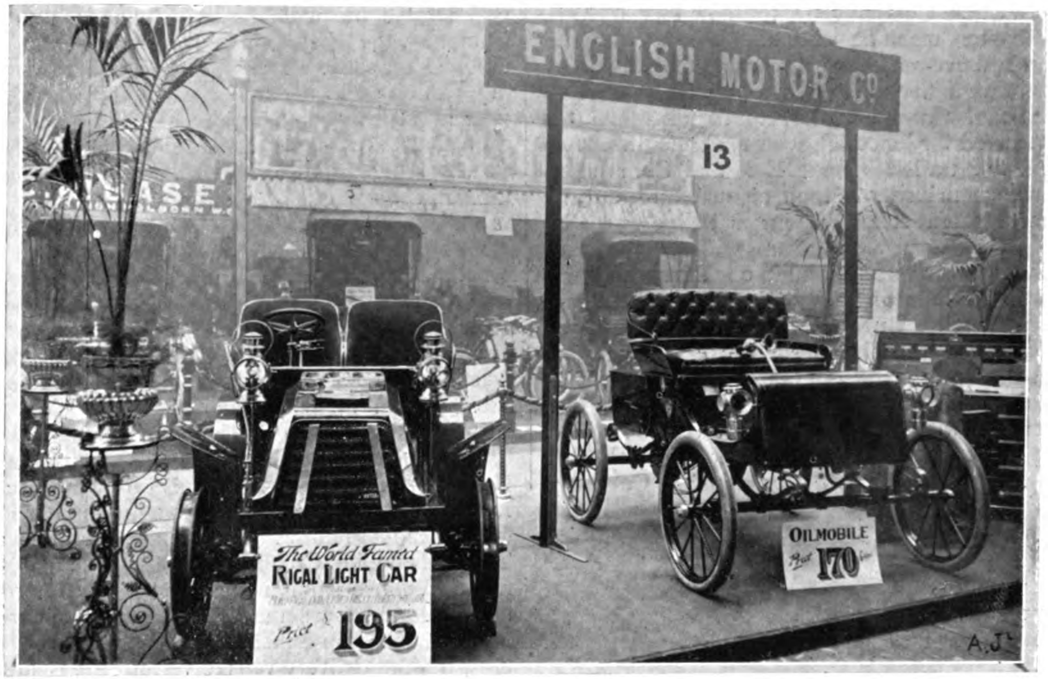
A very imposing and interesting show of electrical vehicles will be made by the City and Suburban Electric Company, the Electromobile Company, and by the Oldsmobile Company. The City and Suburban's most interesting exhibit will be the combined petrol and electric vehicle which we describe briefly below. Of electrical cars they will show a wide range in the matter of size, varying from a small runabout of a new type up to a 15 passenger omnibus. Of the intermediate vehicles, Victorias, Broughams, Surrey Phaetons, and Tonneau Phaetons will be found, some of them being provided with a double battery capable of running 70 miles without recharging, and others with a single battery having sufficient capacity for 40 miles. The Electromobile Company's 1903 type chassis will be on view on their stall together with complete cars built in accordance with the latest Contal system, which has been taken up by them in this country. The Oldsmobile Company will show the Baker runabout which has had a wide popularity in the United States, and they have also brought over the Baker racer, which has earned a not altogether enviable, though widespread, reputation owing to its unfortunate accident last year. The Oldsmobile Company have also taken up the agency for the Vehicle Equipment Company of America, and hope to be able to show some of the heavy commercial vehicles of this make; these include lurries for loads of two and four tons, besides delivery vans of various kinds and of smaller size.

Most of the well-known tyre Companies will of course be represented, including the Dunlop Pneumatic Tyre Company, Limited; the Collier Twin Tyre Company, Limited; the Clipper Pneumatic Tyre Company, Limited; the Martin Pneumatic Tyre Syndicate, Limited; and the Goodyear Tyre and Rubber Company. The Rucker tyre will also be shown in an attractive manner.

THE CITY AND SUBURBAN COMPANY'S PETROL-ELECTRIC CAR.

THE advantages of combining the independence of the petrol motor with the many advantages of the electric car, which have already received considerable attention from us, have been recognised by the enterprising City and Suburban Electric Carriage Company, Limited. They have recently completed a combined petrol-electric car, which we have had an opportunity of inspecting at their Clapham works, and which will be on show at the Crystal Palace. We are compelled by lack of space to hold back our illustrated description of this vehicle till our next issue, but we may mention shortly that its essential features comprise a $5\frac{1}{2}$-h.p. Daimler motor, with electric ignition, mounted longitudinally under the bonnet, and driving an electric generator of corresponding power fixed in the position originally occupied by the change-speed gear. These parts are mounted on a channel steel frame which carries front and rear seats (the car accommodating four) and the battery box. This frame is mounted on elliptical springs on a lower frame, identical with the running gear of the City and Suburban electric broughams and carrying two independent motors mounted on the rear fixed axle and geared directly to the driving wheels. The generator, battery (40 cells of 70 a.h. capacity), and motors are all in parallel. The vehicle has given an excellent account of itself on the road, and the Company are now building two more of 12-h.p. each.

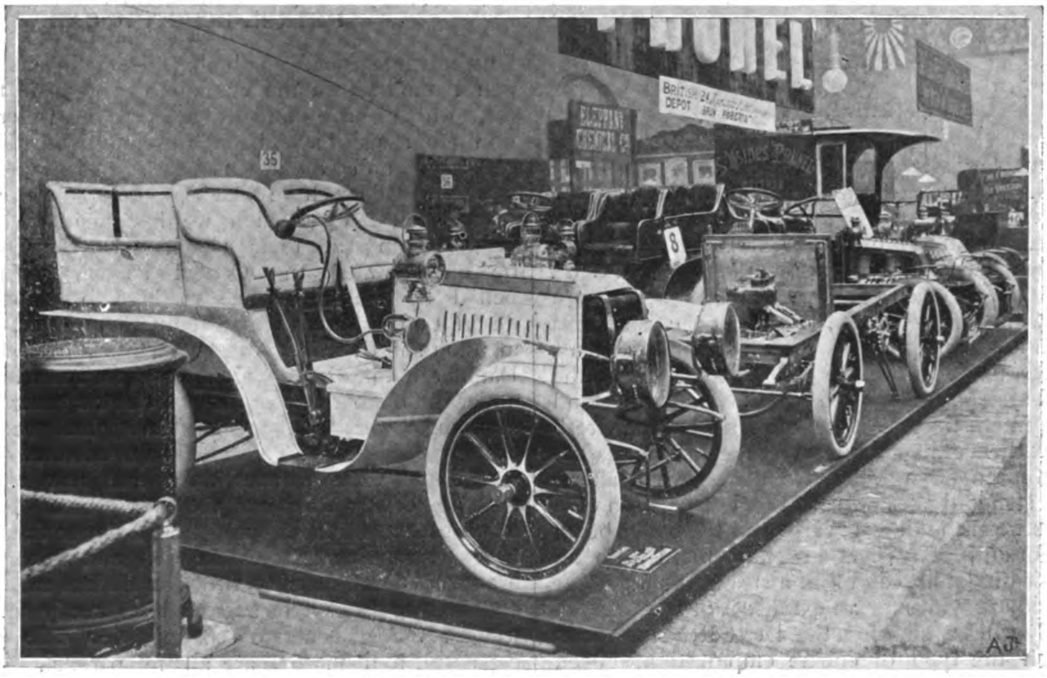
THE STANLEY AUTOMOBILE EXHIBITION.—PART II.



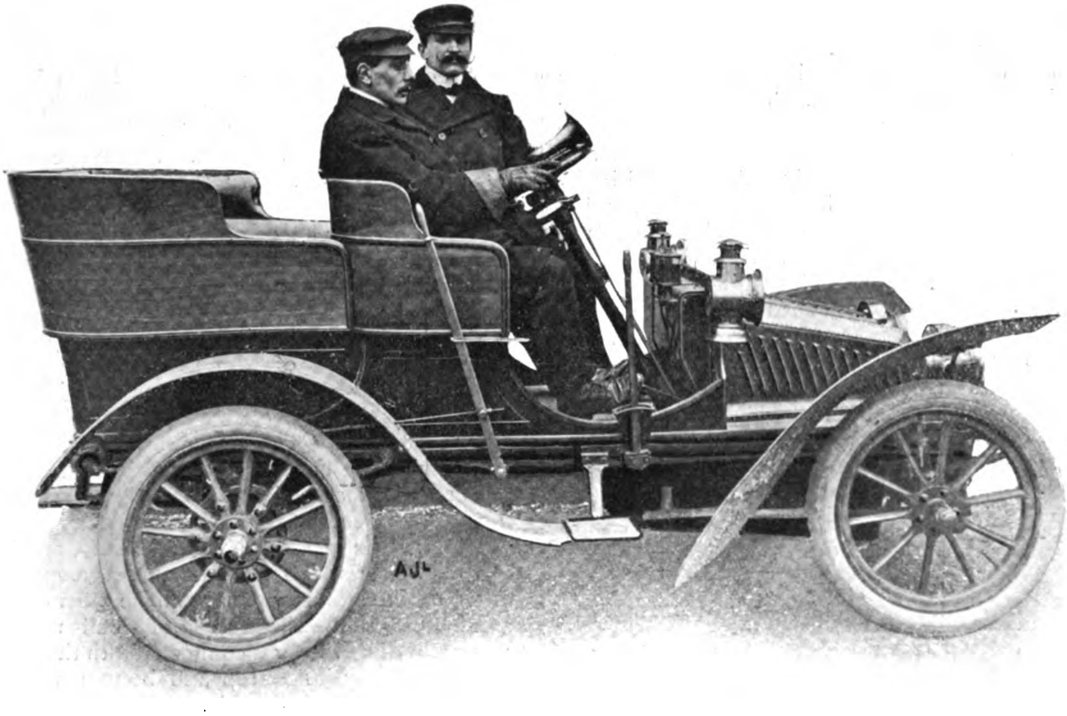
The English Motor Company's Stand.—Stanley Exhibition.

FOLLOWING up our promise of last week, we now give some particulars of the Beckett cars, exhibited by Mr. L. A. Beckett, of Russell Square, W.C. One of our illustrations is reproduced from a photograph taken by ourselves of the smaller, single-cylinder, chassis. The larger car, which has a twin-cylinder engine, is built on almost identical lines, except that a spring cushion drive is introduced in the longitudinal shaft, and that a transverse spring carries the ends of the rear springs.

The framework is of tubular construction, and the engine, with the gear-box, are supported on two longitudinal inner tubes fixed on a slightly lower level. The change gear provides three forward speeds and the "reverse," and is of the sliding spur-wheel type, with the first-motion-shaft

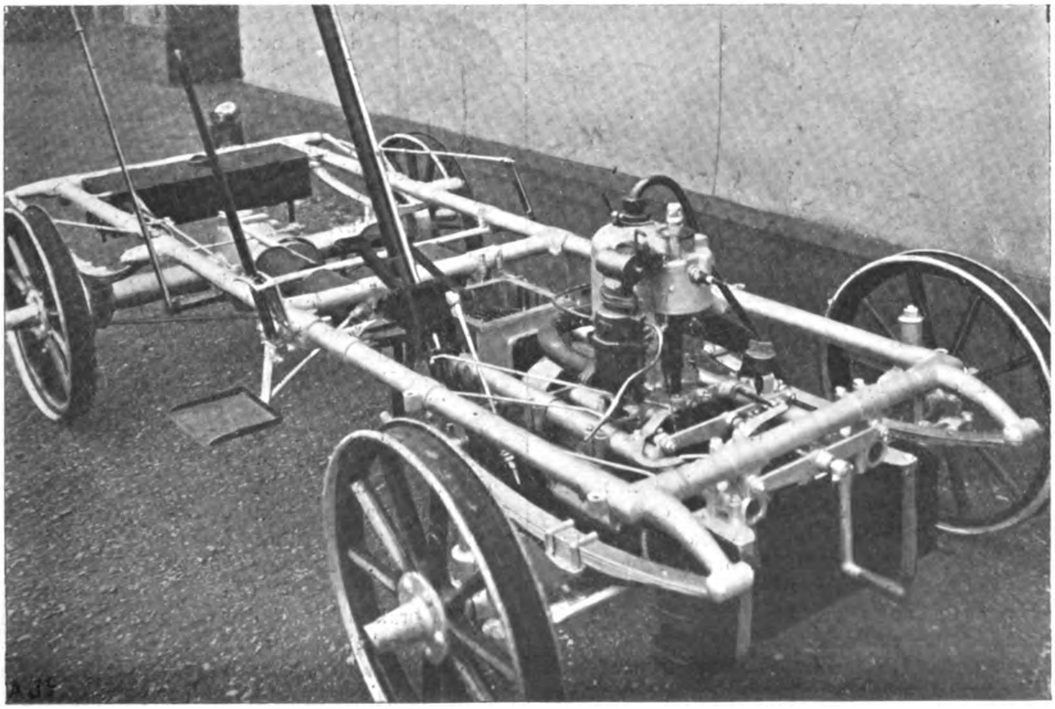


The Prunel Stand.—Stanley Exhibition.



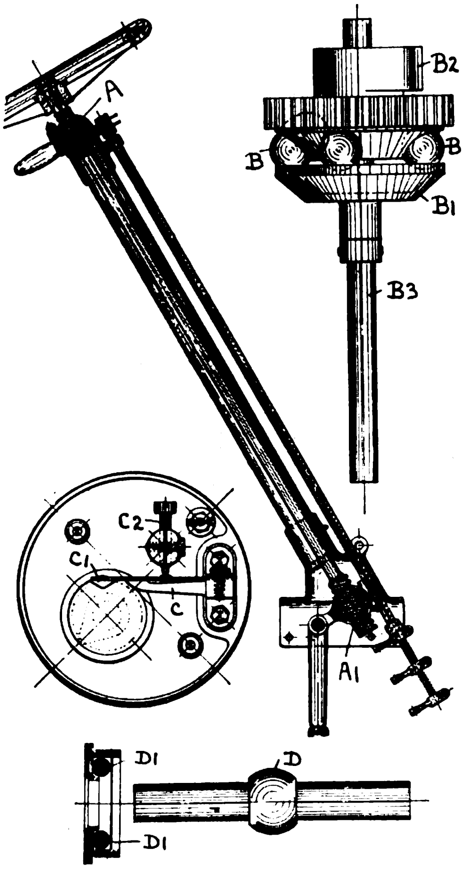
An 8-h.p. Beckett Car.

arranged below the second-motion-shaft. The changes of gear are effected by a single side lever, which can be moved transversely towards or away from the driver, and can in either of these positions be then moved forward or backwards in the usual direction. The sideway movement of the lever brings it into connection with either the second and third speed wheels or with the first and "reverse" gear trains; when in either of these positions, a forward or backward movement of the lever alternatively gives the second or third speeds or the first or "reverse" gears. Two exhaust boxes are fitted; they are fixed in line with and behind the underframe



8-h.p. Beckett Chassis.

tubes. The exhaust gases are led into the one box first, and from it to the second box. The power is transmitted from the change gear to a bevel drive about the live-rear-axle, by a longitudinal shaft. The tubes surrounding the rear axle are of unusual large size, in consequence of the type of ball bearings which are employed, and which we shall again refer to presently. An internal brake is fitted on the rear end of the longitudinal shaft, and a forked distance-rod passes from the top and bottom of the differential-gear-case to the main frame. The main clutch is of the internal-cone type. The single-cylinder engine, with its special form of carburettor attached through a throttle valve to the cylinder casting, is seen in our illustration. In the 2-cylinder motor, the exhaust valves are normally closed by two helical tension springs instead of by the usual compression spring. The inlet valves are operated atmospherically, and can be removed without disconnecting the carburettor.



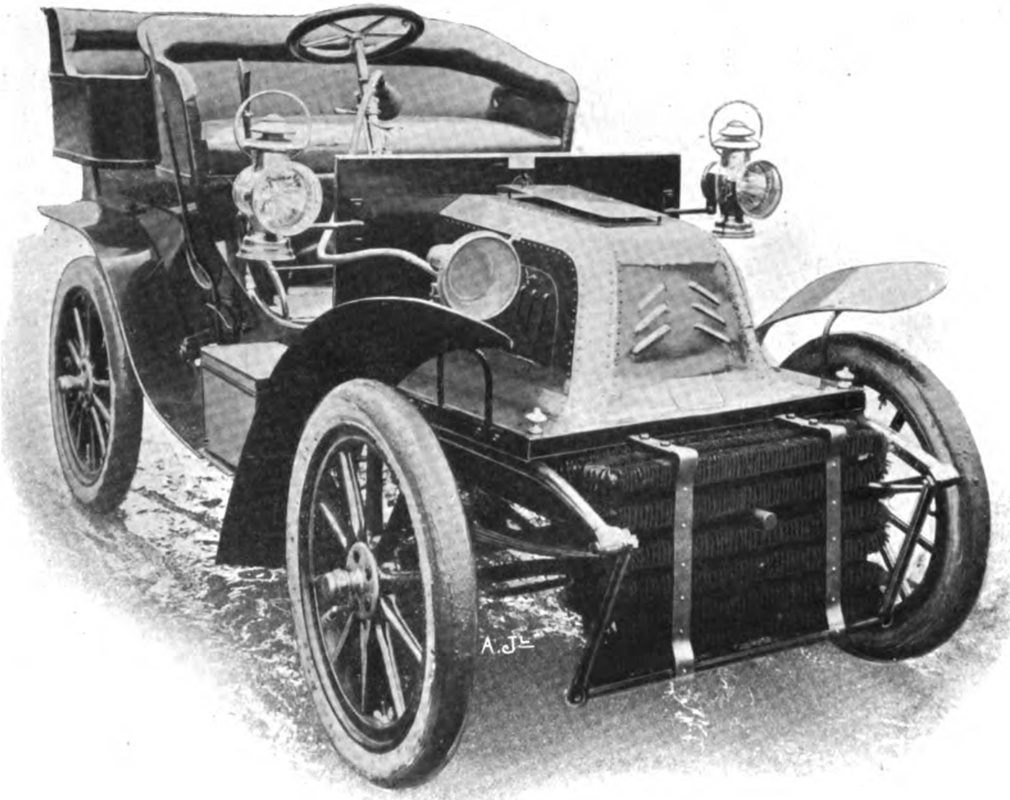
Some Details of the Beckett Cars :—Steering Gear, Governor, Commutator, and Type of Ball Bearings.

The commutator (see illustration) is so made that it can be removed entirely without disturbing the cam which operates it. It fits in place with a bayonet joint. The contact spring, C^1, is insulated from the main body of the commutator, and it is prevented from coming into contact with the lower part of the cam by an arm, C, as seen in the illustration. The electrical circuit is completed as soon as the high part of the cam comes in contact with the spring, the current passing between them. In order, however, to ensure ignition, the cam causes the spring, C^1, to make contact with the tip of an uninsulated and adjustable screw, C^2. The governor is formed by five large steel balls, B, which normally lie in holes provided for them in a casting fixed to the cam shaft, B^3, and which press against the inner face of a thin cone member, B^1, which can slide along the shaft. As the speed increases the balls press outward against the sliding member, B^1, which is connected with the throttle valve to regulate the speed of the engine. The cam, B^2, operates the commutator spring, C^1, already referred to. Ball bearings are fitted throughout the transmission gear. The type of bearing used is of unusual construction, as will be gathered from our drawing. The shaft is fitted with a spherical bearing surface, D, instead of with the usual cone piece. The balls, D^1, are brought up into contact with the spherical face on each side and can be adjusted in much the usual manner. The balls run upon the spherical surface, and consequently the bearing is, to a great extent, self-aligning.

Another characteristic of the Beckett cars is the steering gear. The wheel is fixed to a shaft having a screw thread at each end, the one, A^1 being a left-hand, and the other, A, a right-hand screw. The upper one fits a split nut forming the top of the stationary pillar, and the other carries a similar threaded part in the shorter arm of a bell-crank lever. The longer arm of this lever is connected with the steering wheels in the usual way. The top and bottom worms have an unequal number of threads, and consequently when the steering-wheel is rotated the necessary movement is imparted to the front wheels. The carburettor employed is of the float-feed type, but differs from the majority of those now in use. The richness of the mixture is adjusted by regulating the size of the petrol spray jet, which is done from a small lever on the steering-pillar.

Messrs. Waddington and Sons, of Middlesbrough, showed one of their 6½-h.p. voiturettes, fitted with a single cylinder water-cooled motor, and one of their 10-h p. cars in which twin-cylinder motors are used. The voiturette accommodates two persons on the front seat, and a light spider seat for a third passenger can be fitted behind, if necessary. The larger vehicle is of the tonneau pattern, and is in general respects similar so far as construction and type of transmission are concerned. The main frames are built up of tubes, the engines are fitted in front beneath the bonnet, and the power is transmitted from the gear-box to a live-rear-axle. The type of gear employed is that in which the various trains of wheels are at all times in mesh, and the gear-wheels on the one shaft are normally free to revolve idly. Either speed is brought into operation by means of a key which is caused to slide along in the shaft, and alternatively renders either of the wheels rigid with it. Three speeds and a reverse are available on the voiturette, and an additional forward speed is provided on the 10-h.p. car. The single cylinder motor has a bore of 105 mm. with a stroke of 110 mm. Its normal speed is about 1,000 revs. per minute, and it runs up to about 1,400 revs. per minute.

In the voiturette, the crank-shaft is connected with the gear-box by a main clutch of the internal cone type. The engine and the gear are fixed to inner longitudinal members of the frame. The power is taken by a longitudinal shaft to bevel gearing about the differential on the live-rear-axle. A band brake is fitted on the longitudinal shaft near the casing round the differential, and it is operated by a side hand lever. A foot brake is also fitted, but in this car it applies the side brakes, which are of the internal type, fixed to the hubs of the rear wheels. The steering gear is of the

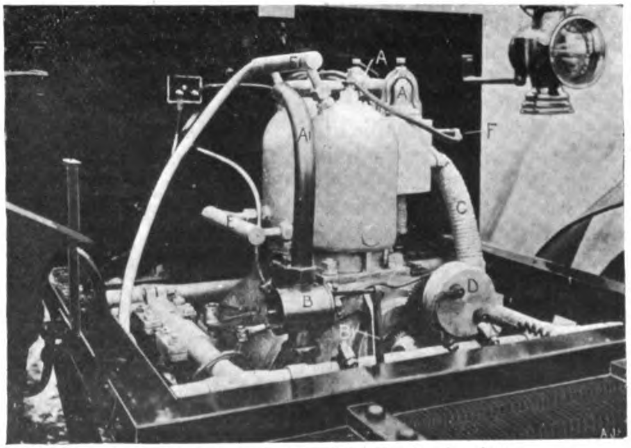


The 10-h.p. Waddington Petrol Car.

wheel pattern; a rack and pinion action is employed. Wooden wheels are fitted, and the pneumatic tyres on them are 750 mm. by 75 mm. The battery and coil for the ignition are fixed behind the dash. The speed of the engine is regulated by two hand levers on the steering pillar; the one regulates a throttle valve on the carburettor, and the other varies the time of ignition. The back axle is connected with the main frame by distance rods pivoted to the top of the casing surrounding the differential.

On the 10-h.p. car the crank chamber of the engine encloses a built-up crank-shaft in which four flywheels are used. The inlet valves are atmospherically operated, and the carburettor employed is of the Sthenos type (described elsewhere this week). The governor is mounted on the crank-shaft, and operates a throttle-valve. The circulating pump is driven by spur gearing from a large toothed wheel in front of the flywheel. On this vehicle the front axle is formed by two parallel tubes, and a curious feature of its

The 6½-h-p. Waddington Voiturette.



10-h.p. Waddington Car—The Engine in place.

A Inlet valve covers.
A1 Induction pipe.
B Throttle valve.
B1 Governor lever.
C Exhaust pipe.
D Commutator.
E Water pipe to jackets.
E1 Water pipe from jackets.
F Ignition plug.

design is that the longitudinal shaft does not pass direct to the bevel-gearing driving the rear axle. The casing surrounding the differential is instead so made that it carries a short countershaft inside it mounted parallel with the axle. This short shaft is driven by bevel wheels from the longitudinal shaft, and it also carries a spur-wheel which meshes with a larger one fixed to the shell of the differential. The object of this intermediate-gear arrangement is to reduce the diameter of the casing surrounding the differential, and yet to secure a considerable reduction of speed ratio between the longitudinal shaft and the axle. It might also enable the owner to reduce or increase the gear ratio between engine and road wheels for racing or for hill-climbing if he so wished. A brake drum is fixed on the one end of the small intermediate shaft outside the casing, and the band which acts upon it is operated by a side lever. The car has been put on the market at £290 and the voiturette at £185. Messrs. Waddington and Sons also showed a 9-h.p. tonneau fitted with a De Dion engine, and samples of their motor bicycles and accessories.

The new carburettor which is being fitted to the latest Germain cars, which we briefly mentioned last week, was shown on one of their vehicles at the Exhibition. This apparatus does not require detailed description, because in general construction it is identical with the Krebs carburettor, fully dealt with in our columns recently. The admission of auxiliary air is automatically regulated according to the vacuum produced in the mixing chamber, so that a greater quantity is admitted when the engine runs faster, and the vacuum is automatically maintained comparatively constant. Four holes are provided for the auxiliary air, and the corresponding windows, through which it enters the sliding valve sleeve, are triangular in shape and of two different sizes. Their size and precise shape has been determined after lengthy experiments, and it will be recognised that the success of the device depends entirely upon the correctness of these, and upon the strength of the spring employed.

Amongst American vehicles not previously mentioned by us was a "U.S. Long Distance Car," shown by Mr. C. R. Radcliffe, and a "Peerless" car, exhibited by the Petrol Power Company. The former is fitted with a 7-h.p. single-cylinder horizontal motor, in which the cylinder bore is 5 ins. and the stroke 7 ins. The body is supported on side springs, front and rear, and the power is transmitted by a chain to the rear axle. Three forward speeds and a reverse are obtained by epicyclic gearing. The wheels are fitted with detachable double-tube tyres.

The Peerless car is built on European lines, and has a 2-cylinder vertical motor beneath the bonnet in front. The main clutch is flexibly connected with the gear-box, and a direct-through-drive is obtained on the top speed; the gearing is of the live-rear-axle type; the engine is automatically governed. A curious feature on the car is the method employed for lubricating the various parts. A cross-shaft, lying behind the crank chamber, is driven by gearing from the countershaft. The commutator is mounted on one end of it, and the other end passes into a mechanical lubricator fixed to the main frame. The lubricator consists of a series of pumps which force the oil into the various pipes leading from it. The rear wheels of the vehicle revolve upon the outside of the tube which forms the stationary part of the axle, and the weight of the vehicle is therefore taken off the shaft forming the live portion of it.

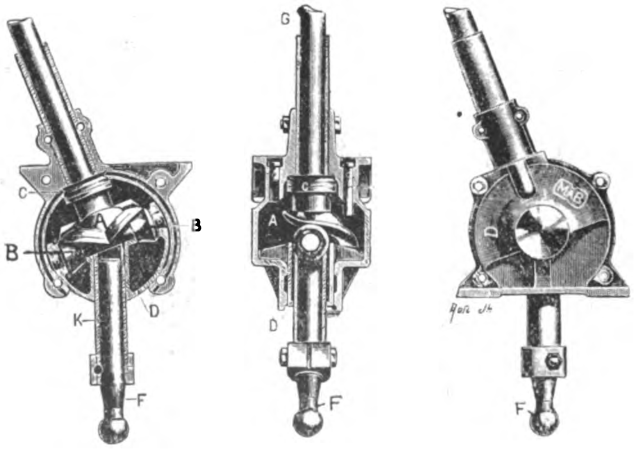
THE ANNUAL A.C.F. SHOW IN PARIS.—Part VII.

(*Conclusion*).

All the well-known builders of electrical vehicles were well represented, but we did not notice anything particularly novel in connection with these vehicles. The important question of combining an electric system with a petrol motor, and thus using the current as a means of transmitting the power from the motor to the rear wheels, has been taken up to a certain extent by several manufacturers, although, as we have before stated, there were comparatively few cars of this character shown. In the Kriéger model, an 8-h.p. De Dion motor, placed beneath a bonnet in front, was connected direct with a dynamo, and the vehicle was otherwise arranged similarly to the electric cars made by this Company; the front wheels were fitted with separate motors suspended in front of the axle, and geared to them. The weight of the car shown was said to be 850 kilogs., and its speed on the level was given as 45 kiloms. per hour. In this system the electric energy is conveyed direct from the dynamo to the motors, changes of speed being effected by a controller which connects the windings of the motors in the required combinations. A very small battery of accumulators is provided for starting the petrol motor, and for supplying the necessary current for ignition. These cells can be re-charged from the dynamo when necessary.

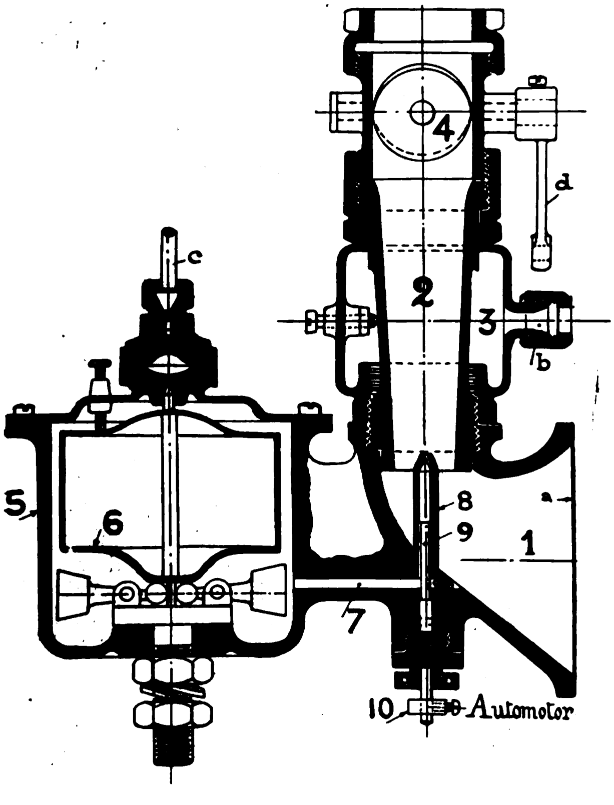
Messrs. Mildé and Co. have a somewhat similar equipment, and also employ an 8-h.p. De Dion motor. They, however, provide a battery of accumulators having a capacity of 120 ampère-hours; the accumulators, therefore, afford a means for storing a considerable amount of energy, and the engine may therefore develop its full power almost continuously. The rear wheels are driven on these cars, and the standard vehicle weighs 1,600 kilogs. The Company also showed a private omnibus similarly equipped, but with a larger battery. Heinz accumulators are employed.

Another combined petrol-electric vehicle was the Electrogena, in which apparently no batteries are used. The motor was a 12-h.p. Aster, fitted beneath a bonnet in front, and coupled direct to a dynamo fixed on the same underframe. A single electric motor was swung about the rear axle and supported from the frame by springs at its front side. The power was taken from a pinion on its shaft to the differential gear on the live-rear-axle. Yet another such combination car was shown on the Fournier stall.



The latest Malicet and Blin Steering Gear.

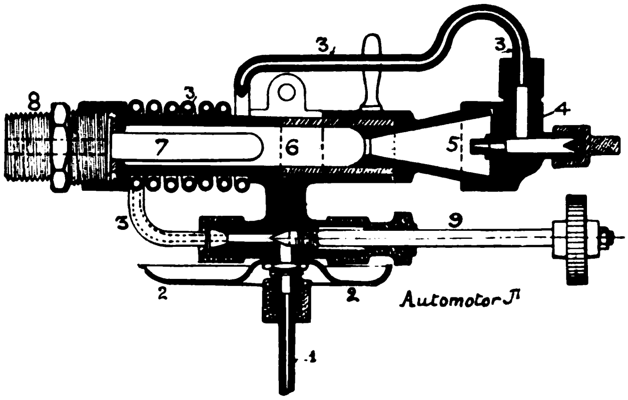
A large number of firms exhibited automobile parts which they are manufacturing in standard sizes, and are prepared to supply to manufacturers of complete cars. Amongst these the most noticeable stall was that of Messrs. Malicet and Blin, of Aubervilliers, Paris, who have laid down a very large plant of automatic and other modern machine tools for the accurate manufacture of gearing of all kinds, and in large quantities. In connection with automobiles, they showed a great assortment of change-speed gears, live-rear-axles, steering gears and cut-gear wheels. One of the most interesting devices shown by them was the new steering gear, of which we reproduce drawings. In this apparatus a specially constructed cam, A, is fixed to the lower end of the steering rod, G, which carries the steering wheel. The cam is of a disc pattern, and is so shaped that its under face at all times presses against two conical hardened steel rollers, B, on opposite sides of its centre. The profile of the cam is such that it simultaneously depresses one roller and allows the other to rise, both of them being kept in contact with its face, thereby preventing back-lash. The rollers, B, are carried on pins, which are fixed to the cylindrical casting, D, to which the steering arm, F, is secured. The arm, F, is adjustable as to length by a telescopic joint, K. As the cam is moved about its axis, the steering arm, F, is forced backwards or forwards as in the more ordinary forms of steering gear. The great advantage, apart from simplicity of parts, which has been aimed at in this design, is that the steering gear is made irreversible when the car is travelling in a straight line, but when turning very sharp corners it is only necessary to move the steering wheel through a very small angle; the further the wheels are deflected from the straight, the less is the necessary movement of the steering wheel to deflect them proportionally further. The thrust of the cam is taken by a hardened collar, C, and provision is made for taking up any back-lash due to wear, if it should occur.



Section of the Sthenos Carburettor.

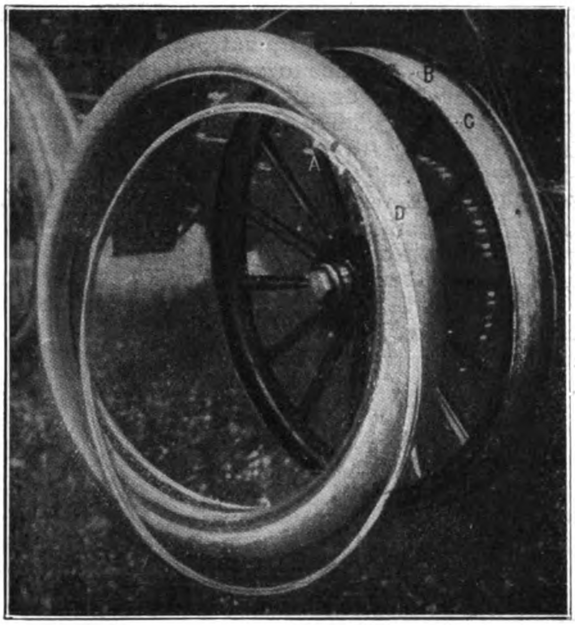
A great assortment of accessories were on view in various parts of the Exhibition, some of them being shown in the basement. As a rule, however, they consisted of well-known devices. The Krebs carburettor, which we fully described last week, was by far the most important. The "Sthenos" was another carburettor shown, the chief feature of which is that the quantity of petrol passing through the spray nozzle can be regulated; we give a sectional drawing of it. Referring to the drawing, the float chamber, 5, containing the float, 6, is arranged in much the usual manner. The float carries a needle valve at its upper end, and the needle closes the passage through which the petrol enters the float chamber from the pipe, C. The spray nozzle, 8, communicates with the float chamber through the passage, 7, and the size of the jet can be regulated by the threaded needle, 10. The air enters the mixing chamber, 2, through the opening, 1, the mouth of which is provided with a gauze screen, *a*. The mixing chamber is provided with a jacket, 3, to which exhaust gases are conducted through the pipe connection, *b*. The explosive mixture passes from the chamber, 2, through the throttle valve, 4, which is regulated by the lever, *d*. It is claimed for this carburettor that it will work equally well with petrol, alcohol, or lamp oil (kerosene).

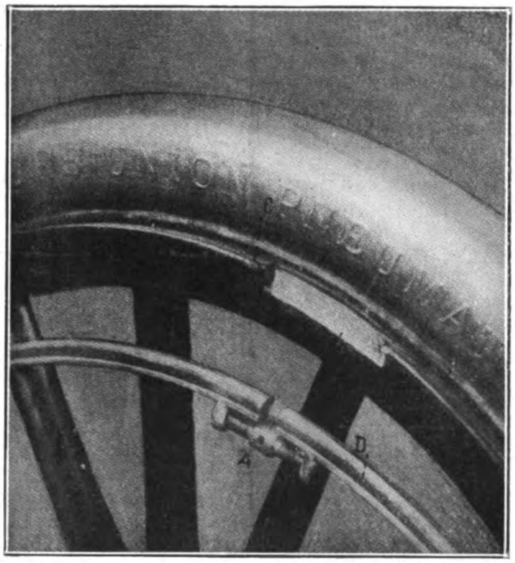
Amongst ignition devices that known as the "Auto-Incandescent" is interesting, being a device for keeping an ignition tube incandescent, in such a manner as to be unaffected by external draughts; it is shown in the accompanying illustration. The ignition tube, 7, is fixed so as to be in communication with the combustion chamber through the nipple, 8. The petrol enters through the pipe, 1, and its passage round the coiled pipe, 3, is controlled by the needle-valve, 9. When cold, the trough, 2, is filled with methylated spirits, which is lighted and heats up the pipe, 3, and the body of the apparatus. The petrol is then turned on and is vaporised before it reaches the spray jet, 4. In a gasified form it passes through the chamber, 5, and is mixed with air in the chamber, 6. It is here ignited, and the flame plays upon the ignition tube, 7.

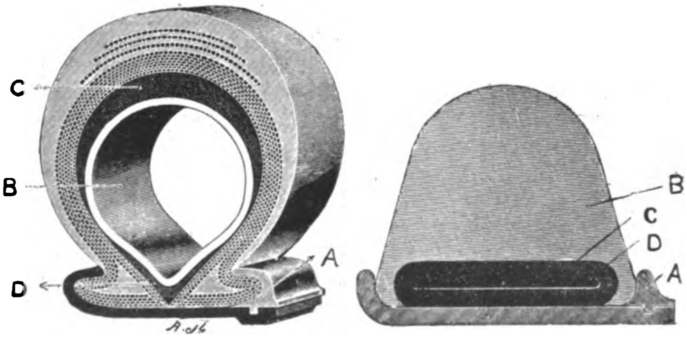


Section of the Auto-Incandescent Igniter.

A very representative display of tyres was made, all the best known Continental makers and the Dunlop Company, having large and attractive stalls. Nothing very novel, however, was shown, although the flat-treaded Michelin tyre, which was much in evidence throughout the Show, attracted considerable attention.



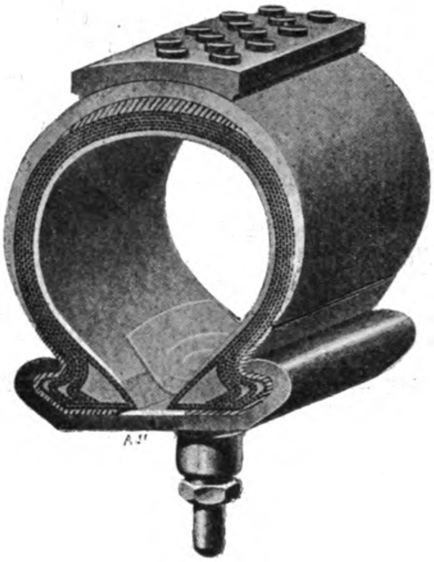




Sections of the Peter Solid Rubber and Pneumatic Tyres and Rims.

Herr Peter have adopted a method of attaching the tyres to the wheels which is shown in our illustrations. Referring to the photographic reproductions from a wheel fitted in this way, it will be noticed that one side of the rim is detachable, and forms a hoop. The ends of the hoop are joined together by a left and right hand screw fitting, which lies in that portion of the rim which is cut away to receive it, and which enables the detachable rim to be tightened up in place. Sectional drawings of the "Peter" solid and pneumatic tyres are also given.

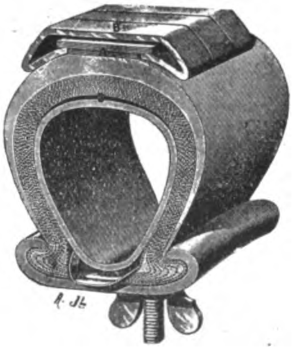
The solid tyre is held in place by a detachable rim, A. The tyre itself is constructed with hard rubber, C, surrounding the steel band, D, these parts being vulcanised to the rubber portion, B. In the pneumatic tyre, A, is the removable rim. Other features which are shown in the section are a special protecting piece, C, which is fitted between the inner tube, B, and the cover, and an anti-nipping strip of fabric, D, which is inserted on the under side of the inner tube.



The Sampson Leather-shod Tyre.

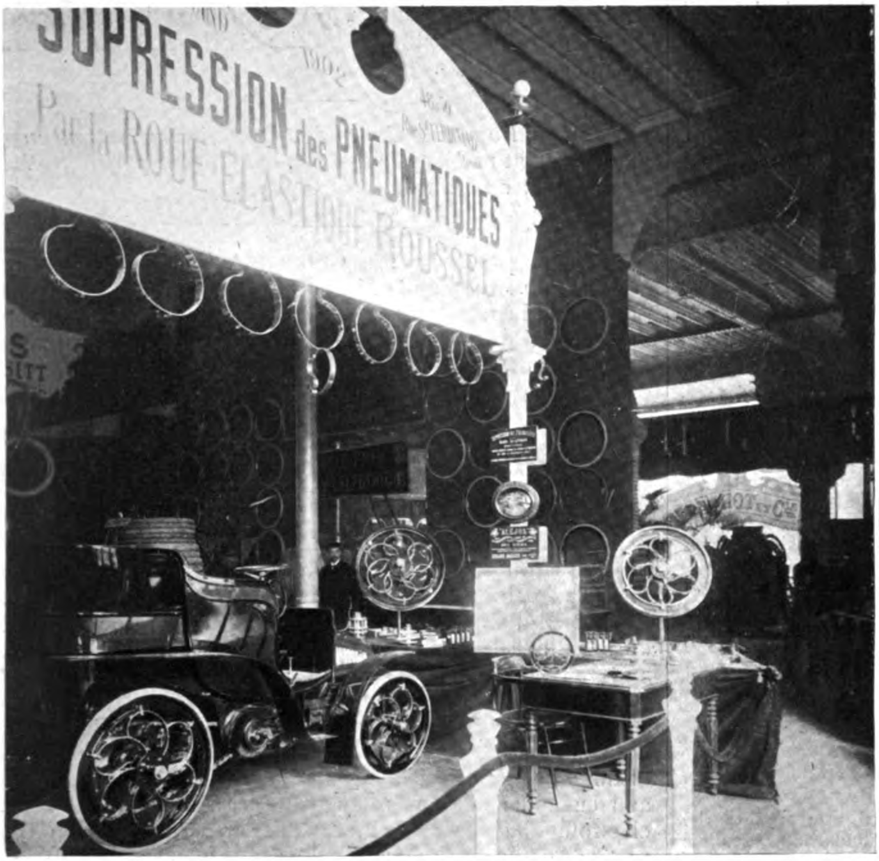
In the Sampson tyre a leather belt is riveted by copper rivets through the tread of the tyre, and the expanded ends of the rivets are prevented from damaging the fabric by the insertion of a strip of leather outside the canvas layers. Leather is also used around the feet of the outer cover, between it and the rim.

Several companies showed armour-clad pneumatic tyres. The Ferré design, which we have previously dealt with, was on view, and the makers of it also exhibited tyres in which the metal strips lie flush with the face of the rubber tread, and are separated from one another by spaces equal to their own width. Other designs of a novel character were the Chameroy and the Gallus, drawings of which we give. In the former, metal strips, A, are fixed by rivets passing through the tread, the inner ends of which are prevented from chafing the inner tube by a layer of material, C. Detachable steel pieces, B, are fitted over the bands, A, in



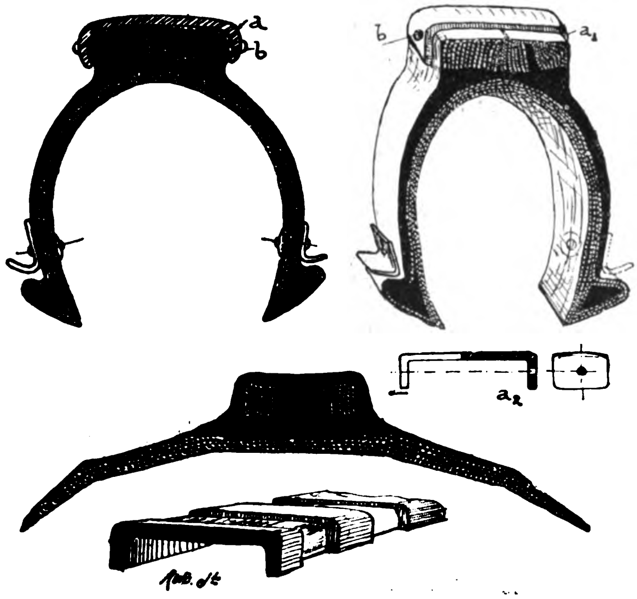
Section of the Chameroy Armour-clad Tyre.

the manner shown, and are sprung into place by slightly raising the strips, A, with a screw driver, between the points at which they are fixed to the tread.



The Roussel Spring-Wheel Stall.

In our drawings of the "Gallus" tyre, the old form of metal strips, *a*, were convex in section, and were bent to the radius of the wheel. In the 1901 type, a^1, they are somewhat straighter, and it will be noticed that the tread is a different shape. In the 1902 type, which is shown beneath these, the strips, a^2, are quite flat transversely, and lie tangentially to the wheel. They are fitted to a tread which is vulcanised on, and the canvas is arranged as seen in the opened-up cross-section. The lowest drawing shows the "demi-ferré" tread.



The Gallus Armour-Clad Tyre. Recent and earlier designs.

An ingenious spring wheel was shown by Roussel, Lecomte et Fils on their stall, a photograph of which we reproduce. We also noticed a Gardner-Serpollet car, fitted with these wheels, running in the neighbourhood of the Exhibition. The rim of the wheel is connected with the hub through flat springs, which are bent so as to pass from the hub to the felloe and back again to the hub. They support the weight of the car and give flexibility to the wheel. The rim is connected by spiral springs with a disc, which is fixed to the hub and lies on the inner side of the wheel; these springs are placed tangentially and take the drive. The rim is shod with a solid rubber tyre. There are no spokes and no guides of any kind.

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THE Udine (Italy) Exhibition will include an important section for automobiles and accessories, divided into six classes.

* * *

PUTTING IT MATHEMATICALLY.

APROPOS of Sir A. Rollitt's little joke at the expense of constituted authority, "$pc + lsd = pc$ (squared)," a humorous correspondent of an algebraic turn of mind, whose humour has come to us through the medium of Mr. Moffat Ford, has worked out the problem a little more elaborately, as follows:—

If m be the driver of a motor car, working with velocity v; if a sufficiently high value be given to v, it will ultimately reach pc. In most cases v will then equal o. For low values of v, pc may be neglected, but if v be large it will generally be necessary to square pc, after which it will again assume a positive value.

By a well-known elementary theorem

$$pc + lsd = (pc)^2$$

but the quadrature may be sometimes effected by substituting x^3 $(= x.x.x)$ for lsd. This is preferable if lsd is small with regard to m. If lsd be made sufficiently large, pc will vanish.

Now if jp be substituted for pc (which may happen if the difference between m and pc be large) the solution of the problem is more difficult, because no value of lsd can be found to effect the quadrature of jp, for, as is well known $(jp)^2$ is an impossible quantity.

The quantity pc is often irrational, and may result in a totally arbitrary value being assigned to v, differing largely from the real value; this may, in the limit, result in

$$(pc - m)\,v = \infty$$

This equation, however, can only be solved by the use of logs, but they must be used with care.

NOTE.—The value of v need not suffer diminution if a circle be described about pc, but if we cannot get round pc, then the method of least squares should be used, especially when lsd is a rapidly vanishing quantity.

THE AUTOMOBILE CLUB 1,000 MILES TRIAL, 1903.

The following recommendations for the apportionment of marks has been arrived at:—

(1) Marks shall be given for "Accuracy of advertised h.p.," which is to be taken from the *best* performance of the car on any one hill.

(2) Three marks per mile are to be awarded for each day's run as Reliability marks; deduct one mark per minute for stoppages as before; 1,500 marks allotted for "Cleaning, adjustment, and replenishing," deducting one mark per minute as usual, to apply to Crystal Palace deductions only.

(3) Marks:—

3,000 for Reliability.
1,500 ,, Cleaning, &c.
1,500 ,, Hill Climbing.
500 ,, Condition.
250 ,, Brakes.
250 ,, Steering.
250 ,, Silence.
250 ,, Vibration.
500 for Speed.
250 ,, Dust.
250 ,, Restarting on hill.
250 ,, Vapour or smoke.
250 ,, Appearance.
250 ,, Accuracy of h.p.
250 ,, Fuel Consumption.

(4) Fuel consumption marks to be:—

For 30 miles per gallon for car weighing one ton laden.
For 10 miles per gallon for car weighing one ton laden.
For 45 miles per gallon for car weighing half ton laden.
For 15 miles per gallon for car weighing half ton laden.

(5) For price deduct from the grand total one mark for every £1 sterling above the minimum of the class at which the car is entered.

(6) Hill climbing formula $= \frac{S \times (P + 6)}{(£ + 2000)} \times \frac{A \times C}{N}$

S = speed in miles per hour on hills; P = number of passengers carried; £ = price in pounds; N = the number of hills on which trials are held; A = the average gradient in percentage; C is a constant (?17).

(7) Formula for speed:—

$$\frac{S \times (P + 6)}{(£ + 2000)} \times 3000.$$

THE QUESTION OF AFFILIATION.

The following proposals have been put forward in regard to the functions and the constitution of the Motor Union and the Automobile Club with respect to the control of automobile sport, that (1) The Motor Union continue to perform work similar to that which it now carries on; (2) All automobile fixtures (other than motor cycling events) of a national description to be administered by the A.C. Sporting Committee. This Committee to be of a representative nature, and to consist partly of members of affiliated clubs; (3) Affiliated clubs to form Committees of a similar nature and construction for the same work for local sporting events which must be held under the A.C.G.B.I. rules, licence for such meetings to be applied for to the parent Club; (4) A Motor Cycle Association or Union to be formed which shall be open for membership to all classes of motor cyclists generally, this body to be governed by a Motor Cycle Racing Board to be elected hereafter. This body would make rules to govern the sport throughout the United Kingdom, and the Motor Cyclists' Union of Ireland and the Scottish Cyclists' Union of Scotland are to be informed that, failing their wishing to govern motor cycling in their respective countries, that the Automobile Club is prepared to administer motor cycling by means of the new organisation. If these bodies intend to govern in their own districts, that they be invited to be represented on the central board for framing rules, and the two societies to administer these rules in their respective countries.

SIDE-SLIP COMPETITION.

The basis upon which this competition is to be held by the A.C.G.B.I. is as follows:—Competing devices will be submitted to a preliminary test for eliminating obviously unworthy appliances. A test of comparative merit to take place on a private track prepared with slipping clay or other material, the negotiation of S-bends between limits without materially slipping to give the figure of merit. Long runs on limestone or other natural greasy roads to be arranged for in suitable weather, and an endurance test for durability to be taken similar to the tyre trials. In arriving at the results of tests, the design of car on which the device is tested as affecting side-slip will be considered. Liability to dangerous disarrangement or dislocation will be taken into consideration.

An Italian "Chambre Syndicale" for automobilism is being formed.

Mr. J. Fuller Eberle, of Bristol, has been elected President of the Institute of British Carriage Manufacturers for the current year.

We learn from the *Centralblatt fur Accumulatorenkunde* that excellent results may be obtained by employing *rolled* antimonial lead for accumulator plates.

It is proposed by the German Automobile Union to establish an Automobile Museum to show the development of the industry. The German Government is being approached with the object of obtaining a monetary grant in support of the scheme.

A handy little pamphlet describing the principles on which the Electromobile Company, Limited, of Juxon Street, Lambeth Road, are conducting their scheme for supplying electric vehicles, has been published by the Company. The carriages are of English construction, designed on the latest and best French system. All batteries are interchangeable and have a capacity of from 40 to 50 miles. Exhausted batteries can be exchanged for fully-charged ones within five minutes at any of the Company's depôts, and the housing and complete maintenance of customers' carriages is undertaken upon inclusive yearly terms, substantial allowance being made to the owner who gives notice of not requiring the use of his carriage for a period of three or more weeks. Qualified drivers can be supplied and customer's own men taught to drive and manage these electromobiles for a small fee. The prices range from 450 to 650 guineas, the standard types of carriages being Victoria, for four persons; Coupé Brougham, three persons; Single Landaulet, three persons; and Double Landaulet for five persons. The prices include tyres and all important accessories.

In our last issue we referred to the new Mercedes racer, in which the motor is mounted approximately in the centre of the vehicle, with the object of concentrating the weight as much as possible near the middle of the car. There seems to be much in favour of this arrangement, at any rate for racing cars, and there now appears to be a probability of the Darracq cars following suit in this respect, at least it appears this is likely to be the result of a recent experience of M. Osmont when driving a light Darracq at speeds approaching 150 kiloms. per hour. Though he could steer the car straight, the rear bounced about to such an extent as to prevent his attaining such speed as the engine could well have given. Mons. Théry's experiments with a light Decauville in carrying 50 litres of fuel in a tank situated directly over the rear wheels, showing as they did the increased stability of the car with even this slight displacement of the centre of gravity towards the rear, certainly confirms the value of the new departure, which like so many other successful innovations has been introduced by the Cannstatt Company. The Paris-Madrid and Gordon-Bennett races will, no doubt, provide valuable data on the importance of this innovation.

MOTORS FOR MEN OF MODERATE MEANS.*

CAPTAIN CAMPBELL, by way of introduction, said he spoke from experience as an owner, first of an American steam automobile, and then an English petrol car. He disclaimed responsibility for the title of the paper, recognising the difficulty of defining what constituted a man of moderate means as opposed to the rich man or the poor one. He proposed simply to give his own experience as an owner of a fairly representative class of practical and all-round serviceable motor car, leaving the would-be motorist to decide for himself whether his income justified him in embarking upon a sport which, while it had decided utilitarian possibilities, could not be called an economical one. The subject was divided into five headings, viz. :—

(1) Cost of car, and extras.

(2) The ordinary running expenses of the car, which may be said to be perpetual expenses, and include petrol, lubricants, repairs to car body, frame, and engine, and lastly, under this heading, upkeep and renewals of tyres.

(3) Adaptation of ordinary coach-house for the storage of a motor car.

(4) Training a groom for motor work.

(5) Cost of groom and coach-house per annum.

Under each heading any saving in ordinary expenses through being the owner of a motor car was given credit for by way of an alleviation of the more or less heavy expenses attendant upon motoring.

Capt. Campbell had some very succinct remarks to make upon the methods of the "repairer sharks," and in warning all automobilists against them advocated co-operation amongst motor car owners in checking the evil, and keeping down the costs for repairs—recommending that the maker of the car should whenever possible be entrusted with the work. He found great saving since he took to motoring in train fares, cabs, tips, &c., besides having the advantage of being able to travel direct when visiting friends, often through charmingly situated villages where were to be found comfortable old time inns. Where an inn had a not too attractive appearance for a night's stay, no inconvenience was experienced from going on to the next place, be it 10, 20, or even 30 miles extra.

Dealing with his statistics, he said they were based on carefully kept accounts from April to December last year, the period from the time of purchase of his 10-h.p. touring car, the distance covered being 6,600 miles. His car weighed full laden with three passengers 27 cwt.; empty, about 17 cwt. The all round working speed was about 18 m.p.h.

Under the first heading, "Cost of car, and extras," he found: price of car, £525; extras, carriage rugs, &c., £26 15*s.* 2*d.*; tips, &c., and learning to drive, £3 17s. 5*d.*; delivery of car from makers, £3 18*s.* 10*d.*; total, £559 11*s.* 5*d.* These items are the first cost of the car as opposed to the "running expenses," which, of course, are continuous so long as the car is kept in commission.

Running Expenses.—Petrol, £21 15*s.* 8*d.* (this works out at about ¾*d.* per mile, but it should not be forgotten that there is a considerable amount of waste in petrol in using the car for town work; it is left standing for odd five minutes at a time with the engine running, thus increasing the cost for petrol without increasing the mileage). Lubricants, £6 16*s.* 7*d.*; maps, 5*s.*; sundries, £9 17*s.* 2*d.*; repairs to car body, frame, and engine, £67 0*s.* 5*d.* (this works out at about 2½*a.* per mile). This amount includes accidents, which resulted in two bent axles—one due to side-slip, and the other to running into a ditch to avoid a collision. The side of the car also was kicked through by a led horse, the owner of which compromised by paying half the damage done (after getting a very strong letter on the subject from our friend Mr. Staplee Firth). Tyres, including four new tyre covers, one new inner tube, and fitting two old tyres with "treads," £48 6*s.*; or 1¾*d.* per mile, making a total of £154 0*s.* 10*d.* for running expenses of all kinds for nine months, or at same rate, £205 7*s.* 8*d.* per annum. For the 6,600 miles' run it comes to 5½*d.* per mile. Depreciation and insurance he had not taken into consideration.

Coming to the cost of tyres the element of luck came in. Once he had, at the Pass of Glencoe, on a bad down and up grade of loose metal of about thirty miles, damaged the tyres more than on an average run of 2,000 miles on English main roads.

In the matter of one's ordinary expenses he estimated by means of this car a saving was effected in railway fares, during summer holiday journeys, shooting, &c., of £32 11*s.* 10*d.* His wife used the car for town work when shopping or on social duties, making a further saving, with hire of livery stables, of about £40 per annum. In addition there was the benefit to health and the saving in doctors' bills following the use of a motor car in getting about the country. His stable in South Kensington consisted of a three-stall coach-house, the latter sufficing for the storage of the car and the room over for the groom. He had, assisted by his man, fitted in one of the stalls a carpenter's bench with a steel vice and rack of tools at the cost of two deal planks. The saddle racks he used for hanging up spare or old tyres and tubes.

He recommended the training of a groom or gardener in preference to the regular so-called chauffeur. He found no trouble in this respect, his groom now being a trustworthy and competent driver with only the instruction he could give him and a week's instruction in the care of engines at the maker's.

The cost of motor groom, and coach-house per annum was as follows:—Wages of motor groom at 25*s.* a week, £65; livery, clothes, and boots, £20 7*s.* 3*d.*; licence for groom, 15*s.*; licence for motor car, £2 2*s.*; rent of stables, £30; taxes on stables, £8 17*s.* 4*d.*; light, say, £1; water, £1 12*s.* 4*d.*; Christmas present, 10*s.* Total, £130 3*s.* 11*d.*

His motor groom, when not engaged with the car, filled up his time with other duties, such as brushing boots and clothes, and doing odd jobs about the house. Such small matters made a difference to the man of moderate means. A handy man about could save a considerable part of his wages to his employer by that means in the course of a year. Captain Campbell was emphatic upon it not being necessary to have a trained mechanic in charge of a car to get satisfactory results, provided the beginner, when he bought his car, mastered the details of the mechanism by spending a few days under instruction at the works where it was built. He advised beginners to find out what happens in the inside of the machine as a result of moving a lever or handle in the driving gear. It paid many times over to be able readily to "diagnose" what was the matter should anything go wrong on the road. A difficulty once located was generally easily remedied. In conclusion, he estimated that to keep a good car running efficiently cost all told about £335 per annum, not including painting and varnishing. The amount saved from other ordinary expenses, as the result of having a car, each individual must estimate for himself according to his daily habit and walk in life.

The chair was at first occupied by the Duke of Sutherland, and afterwards by Mr. Roger W. Wallace, K.C.

Captain Bowman-Manifold, D.S.O., gave some extremely interesting figures of the cost of maintaining a car. He had used one in connection with the Post Office who, after much difficulty, made him an allowance of 4*d.* per mile running expenses, this being an amount which somebody had managed to find a precedent for in days long gone past for work of a similar nature to his. He had covered about 7,000 miles, the expenses being:—Petrol, £14 3*s.* (under ½*d.* per mile); oil and grease, £2 18*s.* 8*d.*; valves, &c., £4 12*s.* 4*d.*; washers, &c., £1 13*s.*; heavy repairs, £24 odd; tyres, £7 14*s.*; and accessories, nearly £20. He found throughout the country a tendency to fleece the motor car owner for petrol, spare parts, and replacements, in spite of which his experience was that it was almost possible to run a car within a cost of 4*d.* per mile.

Mr. Ashton Jonson related his experiences in an extremely crisp and entertaining manner, and whilst acknowledging that the cost had been great to him, in most respects he attributed the expenses he had been put to entirely to his own fault from inexperience, notwithstanding which, the treatment he had received in connection with his car from the Locomobile Company was extremely generous in every way.. For 4,000 miles his tyres had cost him £23, and petrol £24.

Mr. E. W. Peall speaking as to the cost of tyres said he had run his car, weighing empty, 26 cwt., over 3,750 miles at a cost of 2¾*d.* per mile, his speed giving about an average of 18 miles per hour. He pointed out, however, that he always drove with the greatest consideration for his tyres, under all and every condition.

Amongst the other speakers were Major Lloyd, Mr. R. E. Phillips, and Mr. Sturmey.

To obtain the sympathies of every class of society for automobilism is of paramount importance to all its pioneers. One of the strongest arguments in favour of the introduction of mechanical traction is the enormous change which it will effect in the lightening of the burden of the many overworked animals in use in the many phases of commercial life. The Hon. C. S. Rolls, at a meeting of the Church Society for the Promotion of Kindness to Animals, held at Westminster recently, obtained considerable support in this direction as a result of a paper read by him on "The Indirect Advantages of the Motor Car to Horses Generally." Mr. Rolls drew harrowing pictures of the sufferings of the omnibus horse with the frequent stops and starts on greasy pavements, of the horse usually employed for Sunday char-a-banc excursions after working hard the whole week through, and the enfeebled quadruped which has become so associated in our minds with the London four-wheeler. "With a horse-loving nation like ourselves," said Mr. Rolls, such things should not be allowed to continue, especially when a motor vehicle could perform all such work more efficiently and expeditiously. "Lest the horses should consume the food of the poor" was an excuse made centuries ago for preventing the introduction of ordinary carriages. In later days the same bigoted short-sightedness had in like manner prevented the rapid development of the motor car. Mr. Rolls not unjustly drew attention to the point that in most cases of prejudice and fright it was the drivers who were usually far more frightened than the horses. He attributed many of the objections of the public on the score of noise, vibration, smell, and unreliability, to the host of inferior foreign cars with which this country had been infested. He emphasised the advantages of the automobile, which could not tire and was capable of travelling a distance of 400 miles in a day (parenthetically Mr. Rolls remarked this had been done in France) with perfect safety. Better intercommunication, the chief factor of civilisation, would follow the introduction of the motor car. At present an army of scavengers had to be employed in towns to render the streets tolerable, and as much as four tons of manure (laden with microbes) in a busy city were removed daily per mile. The vapour given off occasionally by the automobile stood out in bold contrast to such facts. Again, the transport work in South Africa during the war proved that enormous benefits could be derived by the use of mechanical vehicles. At Commando Nek (26 miles from Pretoria) the net food required for the men and animals was 130 tons per week, which were comfortably conveyed by two transport engines, against 60 eight-span ox wagons, or 960 animals to do the same work. Nine tons of fuel sufficed for one week's working of the traction engines at a cost of £3 12*s*., against 19 tons 16 cwt. of forage for the ox-drawn vehicles at a cost of £222. As a consequence, owing to the expense and difficulty of obtaining fodder in South Africa, the cavalry horses were fed first, there being little or no food left for the oxen, which were then goaded to work in a starving condition until they dropped. The whole of the 960 oxen had to be replaced every six weeks or less, whilst the stench of the dead or dying animals on the roads at an average of one for every ten or twenty yards was mainly responsible for the enteric fever which carried off so many human beings during the war. The vivid pictures painted by Mr. Rolls, the materials for which were drawn from authentic records, it is needless to say, brought about a strong resolution from the Society in favour of the more general adoption of motor vehicles to perform the work at present relegated to horses and other animals.

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* Excerpt from a paper read by Captain Kenneth Campbell before the Automobile Club, January 23rd, 1903.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THREE-CYLINDER MOTORS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As Mr. Lance wants to know, I may say at once that I consider the best balanced motor for automobile use—and that is what we are dealing with—is the one which gives the best results when actually fixed in a car, both as regards turning moment and vibration as set up in the frame of the car.

Mr. Lance is approaching the matter from an entirely theoretical standpoint, and from his letters one must conclude that he has no practical experience whatever of 3-cylinder explosive motors. I do not suggest going into the theory of balance, for the simple reason that we have absolute facts to work on, and, too, as the absolute balance of explosive motors is covered by so very many points, including that of impulse vibration, may I suggest that it is just possible we might, both of us, get beyond the point that could be argued until the matter were very carefully theoretically worked out and then experimentally proved. This latter has already been done, so what good purpose trying to disprove a fact by theory. Possibly it has not struck Mr. Lance that forces *may* balance each other.

Again, Mr. Lance states that the number of impulses per revolution is a matter of indifference, so far as balance is concerned. I would ask, then, has Mr. Lance ever seen a single-cylinder 14-h.p. explosive motor running, say, 900 r.p.m.? and if so, will he take an early opportunity of seeing a 14-h.p. 3-cylinder explosive motor running at the same speed, and then let us know if his opinion is still the same. I would, too, call his attention to the fact that I did not state that a 3-cylinder motor balanced better than a well designed 4.

The question of turning moment is a very important one indeed, where a car is concerned; there is a great difference between a gliding motion and a jumping motion. Your readers who have driven a single-cylinder car and then a multi-cylinder car will appreciate this point.

MAWDSLEY BROOKE.

Lowestoft, Jan. 19th.

A RACING MAN'S VIEW OF THE PARIS EXHIBITION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As foreshadowed, the storm has burst, but from *one* cloud! The curious coincidence of Messrs. Bidlake, Edge, Jarrott, and Stocks' letters not overlapping one another, though almost looking like a combined effort, saves the indulgent reader from suffering reiteration, but will make a reply over *one* signature appear long, no matter how briefly put.

In Mr. Jarrott's letter I am afraid my friend gives me too much credit, and while it is true that Birmingham brains have astonished the world by the way they have succeeded in materially advancing British and Imperial interests in recent years, I am a mere Scotchman, and it would appear that native cautiousness is now being construed into scepticism, though when one finds that there is not yet one all-British motor firm issuing a public balance sheet which shows a profit, one may be pardoned for having been over cautious, as probably I have been. However, I have no longer any doubts, and firmly believe that the motor industry will in a few years rank amongst the most important industrial undertakings of the country.

It is presumed that I probably cannot understand Mr. Jarrott when he writes: "In certain types of cars where a necessity has arisen for a certain design, I would not and do not suggest that certain apparent complications are necessary to obtain satisfactory running results, but, at the same time, to endeavour to build all carriages on the same lines without understanding why, would be foolish,"—I don't—for the paragraph repeated here complete as printed seems to me a string of words without meaning.

"Conclusions" come to by Mr. Jarrott are just as indefinite in his last letter as in his first, and there is a conspicuous, most conspicuous, want of definite statement, unless it be to advise the home makers to do nothing. Some excuse is evidently thought necessary for this want of definite statement, and it is explained that it is withheld because it would educate me. It is not difficult to estimate the strength of the position, "I know, but won't tell because others will then know."

There is now apparent a really unfortunate misconception of my first letter, in that the impression has been created that in some way or other there is a wish to disparage Mr. Jarrott's racing abilities. Nothing was further from my thoughts. I have had the pleasure of Mr. Jarrott's personal acquaintance for a considerable time, and am sure that no one has ever met a better sportsman or a more fearless and skilful driver, and it is a matter of the greatest possible congratulation to all at home that we have a gentleman of Mr. Jarrott's conspicuous abilities, willing to come forward and represent the home country in the Gordon-Bennett and other races, at great personal expense and at risk to his life and limbs. Nothing one could say or write could add to the universal esteem in which Mr. Jarrott is held as a sportsman by all those with whom he has ever come into personal contact.

The remaining portions of Mr. Jarrott's letter are mere platitudes, but fortunately they bring us back to the main issue raised by his writings, as they repeat that his impressions of the Paris Exhibition are that home makers have nothing to learn, and are admonished to "do nothing," as a result of what was to be seen at the Show referred to.

The letter of Mr. Bidlake—a model of clear, concise, and definite statement—neatly summarises my first letter, as, on analysis, being capable of being "boiled down into the suggestion that British manufacturers ought to be copyists." I will gladly go along that road as far as the proper turning with Mr. Bidlake. It is notorious that the Daimler Company were supplied with the drawings of the Cannstatt-Daimler Cars, and paid for them; that they refused to use them; and that as a consequence they lost ground, so that the present directors have had an enormous leeway to make up in getting the present Daimler cars into their high state of efficiency, and putting them into the position they now so happily hold of being in every way a credit to home industries. Originate, by all means; but ask to-day any one who knows, what is the best thing a firm embarking in the motor trade can do, and one will certainly be told, "Take the best French car and copy it, at any rate, to start with."

In this letter we find some well-reasoned queries on the technical points raised in this discussion.

(1.) The objection that the chassis embouti presents difficulties in fitting various styles of bodies, is not borne out by facts except in the case of special cars to seat say seven or more people, as widely different varieties of bodies are at present fitted on exactly the same under carriage. As to whether in the event of an accident the embouti frame would be more costly to repair—it all depends upon the accident. One can see that in the case of a smash affecting the whole length of the frame there would be no great difference, whether a car was made up with this frame or the older type, as both would have to be entirely dissembled, though in an accident affecting only the extension arm holding the front spring, the old style would be more cheaply repaired than the exact Mercedes type of frame. There are, however, such things as embouti frames with detachable extensions for the front springs, and when I use the term "Chassis-embouti" I do not necessarily confine myself to one exact type of frame, but mean to convey a frame made up of U channel steel as in contradistinction to the old angle L iron and wood.

(2.) Mechanically-operated inlet valves may have, as is contended, some greater tendency to wear than the suction-operated inlet valves, but all the parts can be so made as to show after very long use, indeed, almost inperceptible wear, and I think that the point raised is a very negligible factor, and would not amount in the long run to any such difference as may be found in the working of suction-operated valves due to loss of temper in the springs intended to close them.

(3.) In regard to the radiator, no argument in my previous letter has been answered by Mr. Bidlake, except that he says "that to carry less water is not necessarily an increase in efficiency." Agreed, up to the point of cooling the cylinders; but surely less weight—dispensing with a tank and all the pipes to and from—tends to increase the efficiency of the motor car as a whole?

In Mr. Stocks' letter (which appeared in the *Autocar*) I have had an opportunity of acknowledging his many kind suggestions and great help; but, though it can hardly be a matter of public interest, my friend seems to have forgotten that my Company had a considerable financial load to carry, which somewhat militated against the adoption of a recommendation to indulge in the sprints he would have had them make. Anyway, time settles most matters of this kind, and had they followed the advice he writes of, and rushed into the manufacture of motor tricycles and quadricycles to the extent he advised, it is now clear that the result to my Company would have been disastrous—perhaps irretrievably disastrous. As to the accusations of being "behind the times," I have yet to hear of any would-be purchaser of an "Ariel" tricycle or quadricycle who had to go without because he could not get one—at the time Mr. Stocks mentions.

The most unkind thing that one can do to a politician whom one wishes to heckle is to adopt the favourite dodge of raking up past speeches or past policies and hurling them at the head of the unfortunate individual; and with this analogy I will frankly say that my friend Mr. Stocks was right, and I was wrong, and his history of the motor bicycle delay is sufficiently accurate. I thought that what has happened in France in regard to the motor bicycle would happen here, but it is now evident that motor bicycles have taken the fancy of the general public in this country. Some time has been lost, but my friend will be glad to know that the number of Ariel motor bicycles sent out by the Company last year places them among the first six largest motor bicycle manufacturing firms in the Kingdom, and every effort will be made to make up the leeway (if any) lost by overcaution at the start—a deliberate policy which time has not yet shown to have been a mistaken one.

In Mr. Edge's letter (also appearing in the *Autocar*) some most valuable information is given; and while he joins Mr. Jarrott in his advice to British makers to "do nothing" with the three improvements mentioned in this discussion, he makes a very definite statement, that the Mercedes makers have eliminated, 1st, the honeycomb radiator; 2nd, chassis embouti; 3rd, mechanically-operated inlet valves; and, writing as a professed friend of the home trade, he clinches his argument by imparting this information. *Now, if time shows that the information he gives the home maker is correct*, then he will have conferred a very great service on the trade by preventing us, or some of us, from adopting these improvements—improvements which have now apparently been bettered, and in this advice he is supported by Mr. Stocks, who also urges us to give further deliberation to these matters before coming to a decision.

The drives Mr. Edge draws attention to are gratefully acknowledged, and arouse pleasant memories of his good-fellowship; and I must also not omit to remember the loan which he gave me in the early days of a lamp ignition Beeston tricycle. In these drives, Mr. Edge gave me a good example of my contention that it is not absolutely essential to be a skilful or fast driver to know something of motor cars, as he invariably took care that I should never be given at any time an opportunity to drive even one yard.

The choice sneer, hurled at my head, of the "English motor car builder's prophet" will not do me any harm. In a discussion of this sort, it is better to have it conducted in good temper and fairness on both sides, and Mr. Edge's allusion to "motor measles" is perhaps rather unfortunate, for the comparison which he has thought well to make may cause Mr. Jarrott to exclaim, "Save me from my friends!" The businesses which are alluded to as having been "conducted successfully" are presumedly De Dion, and Panhard and Levassor; it is generally understood that they were both successful before the period alluded to, and if I am expected to go back further than this period, to have it synchronize with my "motor measles" stage, then I fear that the word "successful" will have to find a substitute in some other word—certainly "honourably," if Mr. Edge likes, but hardly "successful." It would have been a good thing for many thousands of shareholders in English companies if overcaution, or as Mr. Edge styles it "motor measles," had been a little more prevalent. I have very great pleasure indeed in making the amend Mr. Edge desires me to make in regard to the water cooling of that grand car—the Napier. My statement was based upon general observation, and so far as the particular car mentioned by him is concerned, I was out on one in November last, in fact, on the car's maiden trip. This car is, I believe, the most powerful, as it certainly is one of the most expensive, offered to the public, and in that car the water required renewing about every 150 miles. No harm can possibly arise from the exact statement which I made regarding the capacity of radiators, which referred to radiators "ordinarily fitted." More especially since Mr. Edge has now stated that the distance I gave is less than can be attained on some few of the cars of the make he mentions.

In conclusion, I submit that no shadow of an argument has yet been advanced to show that my contention that "there were real advances to be seen at the Paris Exhibition" is incorrect; and if there is much to learn (to "copy," if the word be preferable), then can there be justification for anyone, particularly those mainly interested in the exploitation of foreign cars, writing to the papers with the idea of inducing home makers to stand still?

Yours faithfully,
Chas. Sangster.

To the Editor of The Automotor Journal.

Sir,—Just a few lines with regard to the latter part of your correspondent's (Mr. Bidlake's) letter in your last number, referring to water-coolers. His contentions are ridiculous.

As an example of the efficiency of the commonly called "beehive" type of water-cooler (originally designed by the Cannstatt Daimler Company for motor vehicle work), I beg to give the following, which I personally supervised:—

I required to drive a small plant of machinery which would probably absorb, with live shafting, about 6-h.p. For the want of better means I dismounted an ancient 2-cylinder 10-h.p. Cannstatt motor, complete with cooler from an omnibus frame (the cooler being the well-known Cannstatt pattern), and fixed same on a temporary foundation, and for three months drove the machinery referred to 9½ hours per day, and never once experienced overheating of the motor. The only water used was that which the cooler contained, viz., about two gallons.

If Mr. Bidlake can quote any authentic case wherein a similarly powered motor has done the same work under the same conditions, but cooled by means of the common filled radiator, as recently used by Napier, Panhard, M.M.C., and a host of others, from a two-gallon, or thereabouts, supply of water, I should like to hear of it.

The filled radiator under all conditions is *not* efficient, whilst the other type is.

Yours faithfully,
Manchester, Jan. 20th. Percy Frost Smith.

LAW REPORTS.

Motor cars which damage the road. A £5 fine at Blackburn. The Act and Wheel Construction.—On the 22nd inst., at the Blackburn Borough Police Court, the Road Carrying Company, Limited, Liverpool, were summoned for causing a locomotive to be on the Yew Tree Brow, "the tyres of which were not in accordance with the regulations under the Locomotive and Highways Act, 1896."

Mr. Holt, assistant solicitor to the Corporation, stated that according to the Act the tyre of the wheel should be smooth and flat, but in the present case they were fitted with a steel stud which could be raised or depressed. When projecting it tore up the macadam road and smashed every stone sett it passed over. The Corporation had suffered much damage by such contrivances, as it cost 2*s*. 6*d*. to replace each broken stone sett. The defendant Company's locomotive had sixteen of the studs, but only four projecting, and these tore up the road for about a quarter of a mile.

A road foreman in the employ of the Corporation gave evidence, and in reply to Mr. Carter, who appeared for the defendant Company, said that the Corporation motor locomotive had similar steel studs on the wheels, but they were never used.

Mr. Carter admitted that an offence had been committed, remarking that the driver had exceeded his instructions. The primary object of the spokes on the wheel was to enable the cars to get over land covered with snow. It was hard for the defendant Company to be singled out among other offenders as a warning to the rest. The Bench inflicted a fine of £5 and costs.

DOINGS OF PUBLIC COMPANIES.

Friswell (Limited).—We are notified that at the annual general meeting of this Company, on the 20th inst., it was resolved to pay a dividend of 6 per cent. on the preference shares and 10 per cent. on the ordinary shares, carrying to reserve £3,260. The sales for the year amounted to £68,666.

Societe Francaise de Cycles Clements et Gladiator.—The second annual meeting of this company was held last Tuesday, Mr. Harvey du Cros, chairman, presiding. The balance sheet showed a profit of £31,000, as against £41,000 for last year. In dealing with the motor section of the company's business, Mr. Du Cros pointed out that the difference in the profits was due largely to their business of manufacturing motor cars. At first the company lost a great deal of money over them and last year was the first time they emerged from loss and began to make money. Last year the profits were based on the manufacture of a 1-cylinder and a 2-cylinder car, particularly a 1-cylinder car in which there was but little profit. During 1902 they got more into the 2-cylinder class and at the end of last year what is known as the 4-cylinder class of car. That was the most perfect car made at the present day and they now had an absolutely up to date motor car and the Company had paid from revenue all the expenses inherent to its production and in the current year they would in all probability derive considerably greater advantages from the manufacture of motor cars than had hitherto been the case. The Clement car, which was made at one of their branches, had rendered itself famous in many ways and was commanding an enormous sale in this country. As to the Gladiator car, the best recommendation he could give for that car was that Mr. Edge had selected it as the particular car for which he wished to obtain the sole agency in this country, and with him that agency had been placed. The certain output of the Company of motor cars, he could state, was about 1,200, and that the whole of these for the current year were already sold. He also was glad to say that Mr. Fenton, who had such an intimate knowledge of the affairs of the Company and who had displayed such considerable tact in administering its affairs, had been joined with M. Clement as joint managing director of the Company. The accounts were ultimately passed as recommended by the directors.

Monarch Motor Company (Limited).—Under a winding-up order, the statutory meeting of the creditors and shareholders of this Company was held on the 22nd inst., at the offices of the Board of Trade. From the statement of Mr. Culley, Assistant Receiver, it appeared that the Company was formed in May, 1900, with a capital of £250,000, to acquire the business, together with the marine motor patents, carried on by Mr. Elias Jessurun, at Twickenham. Mr. Jessurun, who acted as vendor and promoter, was assisted in the formation of the Company by Mr. Lachman and the Commercial Development Syndicate (Limited). The purchase price was £2,000 in cash and £173,000 in shares, the stock being taken over at cost price, and a further sum of £5,000 being paid to carry on the business to the date of the completion of the purchase. The Commercial Development Syndicate guaranteed a subscription of 15,000 shares, and undertook to obtain subscriptions for a further 45,000 shares in return for their being handed 87,100 fully-paid shares, out of which the claims of Mr. Lachman, who had undertaken to subscribe £15,000 shares, was to be satisfied. No prospectus was issued, and apart from the shares guaranteed by the Commercial Development Syndicate and Mr. Lachman, only 2,012 shares were subscribed for. The vendors' shares were issued, and the business of boat builders and marine engineers was carried on at Twickenham. In March, 1902, a debenture for £2,000 was given to the Company's bankers to secure the Company's overdraft, and some time after a receiver on behalf of the debenture-holders was appointed, who has since carried on the business. So far as he (Mr. Culley) was able to trace, no disclosure had been made of the profit made by Mr. Jessurun on the promotion of the Company, and it appeared to him that all the directors were interested more or less in the flotation of the Company. Accounts had been put in showing a creditors' deficiency of £19,760, and a deficiency to the contributories of £207,088. The case was left in the hands of the Official Receiver.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Davis, Allen, and Co., Limited, 6 and 7, Singer Street, E.C., Capital, £20,000 in £1 shares. Object, to acquire the business carried on in London and New York, as Davis, Allen, and Co., and to carry on the business of importers, exporters, commission agents, and merchants, manufacturers, promoters, financiers, &c. Permanent directors, A. G. Davis, W. C. Allen, and H. N. Allen.

International Inventions Syndicate, Limited, 18, Bishopsgate Street, E.C.—Capital, £500 in 1*s*. shares. Object, to carry on the business of motor-car manufacturers, engineers, mill furnishers, merchants, machinists, rubber merchants, &c.

Leeds Motor Car Company, Limited, 5A, King Street, Leeds. Capital, £600 in £1 shares. Object, to carry on the business of manufacturers of and dealers in carriages, cars, vans, wagons, trucks, cycles, and vehicles to be worked by mechanical or other power, &c. The first directors are C. J. C. W. Hyne and T. J. W. Smeeth.

Maudslay Motor Company, Limited.—Capital, £15,000 in £1 shares. Object, to acquire the business of manufacturers of and dealers in motors and engines, whether worked by gas, oil, electricity, steam, or other power, &c.

Mercedes Daimler Motor Company, Limited.—Capital, £2,000 in £1 shares. Object, to carry on the business of steam, oil, electric, and other motor-car builders and dealers, &c.

W. and G. Myton, Limited, 40, Bootham, York.—Capital, £20,000 in £1 shares. Object, to take over the business of a jobmaster, livery-stable keeper, coach, cab, omnibus, and motor car proprietor, &c., carried on by W. Myton at Bootham, Clifton, and Percy Street, or elsewhere in York, as W. and G. Myton.

Pollard Garage Company, Limited, 47, Queen's Road, Bayswater. Capital, £2,000 in £1 shares. Object, to adopt an agreement with E. S. Luard, and to carry on the business of automobile store and garage proprietors, motor car manufacturers and dealers, &c.

Star Motor Agency, Limited, 16, Upper St. Martin's Lane, W.C. Capital, £2,000 in £1 shares. Object, to carry on the business of manufacturers of motors, cycles, and vehicles, and the components thereof and accessories thereto, electricians, engineers, &c.

Thomas Slack and Co., Limited.—Capital, £6,000 in £1 shares. Object, to take over the business carried on by T. Slack, as Thomas Slack and Co., at Wellington Works, Wellington Road, South Stockport, and to carry on the business of cycle and motor car and vehicle manufacturers, &c. The first directors are T. Slack and T. Whitaker.

Vulcan Motor Manufacturing and Engineering Company, Limited.—Capital, £10,000 in £1 shares. Object, to take over the business of motor car makers and repairers, &c., carried on by T. Hampson, J. Hampson, and E. Hope at the Drill Hill, Hawesside Street, Southport, as the Vulcan Motor and Engineering Company.

THE AUTOMOBILE AS A TEMPERANCE ADVOCATE.

Farmer Jaggers (*telling about it after his recovery a month later*)—"I seen the darn spider animal right afore me, snortin' and quiverin' like it wuz achin' fer ter grab suthin' an' make a meal offin it. I figgered the thing out an' calc'lated I better go round by the other road. I hain't had no taste fer licker since."—*Judge*.

NINETY-ONE exhibitors have already been allotted space at the second Belgian Automobile Salon.

THIS year's Laffray Hill Climb, organised by the Dauphiné Automobile Club, has been provisionally booked for July 5th.

MDME. LOCKERT, of *Le Chauffeur*, has entered a 22-h.p. Ader car for Paris-Madrid. As usual, she will be accompanied by her two daughters.

A SIX days' tour through Germany during July or August is being organised by the Bavarian Automobile Club. The proposed itinerary is Leipzig, Berlin, Hanover, Cologne, Frankfort, Stuttgart, and Munich.

ON January 17th we published particulars of the Third Annual Consumption Trial, organised by *L'Auto*, taking place on Feb. 19th. The entries now total up to over 30, the most recent entries being 4 Mors cars and 4 Bardons.

JULY 19th is the date actually selected by the Chambre Syndicale de l'Automobile for the Circuit des Ardennes Françaises. The main classification will be by weight instead of the suggested cylinder capacity, there being extra classes created which will have as their basis the cylinder capacity of the motor.

SINCE our last list of entries for the Paris-Madrid Race, Messrs. S. F. Edge, C. Jarrott, H. R. Kirk, and H. Fournier have joined the competitors, and the entries have been further swelled by 10 Renault cars, 4 Société l'Automotrice light cars, 9 De Dietrich's, 4 Decauvilles, 3 Henriods, and 2 Werner bicycles. The total entries to date are about 90. It is stated that six 90-h.p. Mercedes will be entered in good time. The route is still under inspection by Mons. Tampier on behalf of the A.C. de France, about two-thirds of the road already having been practically mapped out subject to the approval and acceptance of the Organising Committee of the French Club.

PARTICULARS of the "Critérium" for commercial vehicles for both goods and passengers, organised by *La France Automobile*, are now available. In the main they do not differ from the details which we published some few months ago. The course will be from Paris to Monte Carlo (1,107 kiloms) in nine stages, starting from Paris on March 20th to Fontainebleau (80 kiloms.); 21st, to Nevers (173 kiloms.); 22nd, Clermont Ferrand (148 kiloms.); 23rd, Le Puy (133 kiloms.); 24th, Alais (158 kiloms.); 25th, Marseilles (179 kiloms.); 26th, Pioule (107 kiloms.); 27th, Nice (99 kiloms.); 28th, Monte Carlo (30 kiloms.). The four categories will be (*a*) vehicles carrying over 2,000 kilogs.; (*b*) 1,000 to 2,000 kilogs.; (*c*) 500 to 1,000 kilogs.; (*d*) 200 to 500 kilogs.; (*e*) 12-seated passenger vehicles; (*f*) 8-seated vehicles; (*g*) 4-seated vehicles. Competitors in categories *a*, *b*, *e* and *f* are entitled to run the course by extra stages, starting on March 17th, each day's journey being broken at various points. Careful note will be taken of the fuel consumption, whether petrol, coal, or otherwise, and lubricating oil, in order to arrive at the cost per ton-kilometre, and in making the awards the judges will take into consideration the regularity and average speed of the running throughout. The consumption trial will take place at Paris on March 19th during a single run of eight hours. Over 14 entries have been received up to the present, including 1 Turgan-Foy wagon, a Daimler wagon, a Serpollet omnibus, 3 De Dietrich vehicles, 6 Aders, 1 Vinot-Deguingand, and 1 Bardon.

MR. S. F. EDGE has accepted the presidency of the Motor Cycling Club.

THE Stanley Automobile Show for 1904, it is announced, will be held from January 15th to the 23rd.

TO-DAY (Saturday) a meeting is taking place at the Royal Hotel, Norwich, to arrange the basis on which the proposed Norfolk Automobile Club shall be run.

NO. 56 at the Crystal Palace Automobile Exhibition is the number of the AUTOMOTOR JOURNAL Stand. It is in the centre of the main transept, close to the High Level Station entrance.

THE Charron, Girardot and Voigt cars will from now be handled in this country by Evart-Hall, Limited, of Nottingham and London. The latest types will be on view at the Crystal Palace Show.

FRANK F. WELLINGTON, Limited, who will be removing shortly to Long Acre, have been appointed sole agents for the Brooke cars made by J. W. Brooke and Co., Limited, of Lowestoft. The latest types of these cars will be shown at the Crystal Palace.

OXFORD, not to be behind Cambridge, is to have an automobile club, for organising which Mr. W. L. Creyke, who was so smart in securing Serpollet's steam car immediately after it had created its marvellous record at Nice last year, in conjunction with Mr. Claude Rippon, is mainly responsible.

To reach Sir Edward Lawson's estate at Beaconsfield from Windsor by train is not an easy problem if time is of consequence. The King, the Prince of Wales, and others of the Royal party found no difficulties, and the journey all too short, however, last Tuesday, when they drove over in splendid weather for a day's shooting, by means of the motor car.

BEFORE long it will become an accepted axiom for weddings or comings of age to rank in the highest grade of fashionable society, to have a motor car included in the list of presents. Those who in this respect have recently led the fashion are Lord Dalmeny at his coming of age, and the Earl of Kinnoull upon his marriage with Miss F. M. Darell. In the illuminated address presented to Mr. Lionel Rothschild on Wednesday morning last, motoring was a conspicuous feature in the design, as representing the various sports in which Mr. Rothschild takes an interest. As a matter of fact he is one of the most enthusiastic supporters of the new movement.

AN unfortunate occurrence took place at the Wolseley Company's works last week, when an outbreak of fire was discovered in the paint-shop, which at the time was full of carriage bodies, including several being finished off for the Crystal Palace Show. Fortunately, the discovery was soon made, and by the promptitude of the work's staff was speedily overcome, most of the damage to the building and contents being caused by smoke and water. The mishap is none the less unfortunate coming as it has at a time when the Company have great difficulty in keeping up to time with the cars which they have already on order. The damage in regard to the Crystal Palace Show cars it will be extremely difficult to remedy, but every effort of the staff has been made to overcome the difficulty in time for the opening.

The Auchterarder Literary Society were the fortunate listeners last week to a paper on "The Development of Power Traction on Roads," read by Sir J. H. A. Macdonald, K.C.B. (Lord Kingsburgh). Yeoman work in the service of automobilism is being continually done by Sir John, who is one of the most enthusiastic advocates of the pastime. Upon all occasions and frequently at the greatest inconvenience, Lord Kingsburgh attends meetings in all parts of the kingdom, and is ready to help the movement by providing information for the societies at which he presides in the form of papers on topics which in most hands would be voted dull and irksome. In Lord Kingsburgh's hands they become both amusing and interesting, and in many instances against their will and without their knowledge the cause of automobilism is spread amongst his listeners, and new adherents obtained by the delightful lecturing of the Chief Justice Clerk of Scotland.

The King of Saxony has accorded his official patronage to the Leipzig Automobile Exhibition.

Mr. Winthrop E. Scarritt, so well known in connection with the A.C. of America, has accepted the Presidentship of the Pan-American Motor Company.

One of the three 100-h.p. 1903 Mercedes cars in course of construction at the Cannstatt works has been secured for America by Mr. S. Osgood Pell, at the cost of £3,200, delivery to be made after the Gordon-Bennett Cup Race.

Following the example of the British Club, the A.C. of America have now definitely decided to organise a contest for commercial vehicles in the spring. The American manufacturers are now being approached with a view to arranging details.

Some of our *confrères* across the Channel are getting very much annoyed because a certain magistrate in fining an automobilist has termed him an *automobilard.* We trust that in future fines will be reduced where the offender is willing to accept this designation.

Mr. Kenneth A. Skinner has been elected President of the Boston Automobile Dealers' Association which has been recently formed in America. Under their auspices it is proposed to organise an exhibition at Boston subject to sanction being obtained from the N.A.M.A.

Fournier's challenge to Winton has been increased to two races of 25 miles each. The first race is tentatively fixed for July 25th at New York, and the second eight days later at Cleveland. The American Automobile Club are offering a $1,000 Cup for the first event, and the stakes in the second are $5,000, offered by the *New York Journal.* The report that Mr. Charles Jarrott has challenged the victor, after the finish of these races to try conclusions with him is a *canard.*

The date of the A.C. of France Automobile Fêtes being organised in honour of the Presidents and members of foreign clubs affiliated to the A.C. de France has been altered to June 18, 19, 20, instead of June 22–24, as originally announced some few months back. On the first day a reception and banquet at the French Club House will take place, on the 19th there will be a run to Fontainebleau Forest, and on the third day a Grande Fête at the A.C. de France. The invitation by the French Club to support the Fêtes has been accepted by the British Automobile Club.

Capt. Ferber, who is an enthusiastic experimenter with the aeroplane, has adopted a very elaborate arrangement for enabling experiments of this class to be conducted with comparative safety. He has constructed a huge revolving derrick, somewhat resembling a small Eiffel Tower, with a horizontal pivoted lever arm. The aeroplane, with or without the aeronaut, is suspended from this arm, and the whole set in rotation. This enables the lift and other effects produced by the air on the aeroplane to be studied with comparatively little danger of accident. A somewhat similar arrangement was adopted by Maxim when making his preliminary experiments with his great flying machine. Capt. Ferber, our readers will recollect, has made actual experiments on free "gliding" on similar lines to those of the brothers Wilbur Wright.

Oxford Street and Park Lane, and, in fact, all the thoroughfares lying between Thrupp and Maberley's and the Crystal Palace were not a little astonished and amused on Wednesday afternoon by one of the quaintest cavalcades that has ever been seen in the Metropolis. First came two rather battered specimens of *Dobbin communis* tandem, the leader ridden by a postillion. They provided the tractive effort for a dray on which was mounted one of the most recent Oldsmobiles, and this was towing a weird white object something between a whale and an armadillo in personal appearance, and mounted on four large wheels without visible spokes. It was painted a beautiful white and well polished, and from a small hole in the centre emerged the hat-crowned head, by a few inches, of the gentleman who was steering it. Some of the bystanders wanted to know whether the object was being conveyed to take a bath in the Thames or whether its ultimate destination was Chatham or some other naval station where submarines are in demand. It was the Baker racing electric car being towed up to the Crystal Palace Exhibition. Our readers can see an illustration of it in our issue of June 21st last. It had a distinct effect on the traffic. It was escorted by a very respectable crowd of interested foot passengers, and a running fire of humorous derision from 'bus drivers and cabmen. Several of their charges were decidedly scared, and the unusual apparition acted as a powerful accelerator on two bus horses, who fairly took to flight down Park Lane, 'bus and all, in itself an unusual portent.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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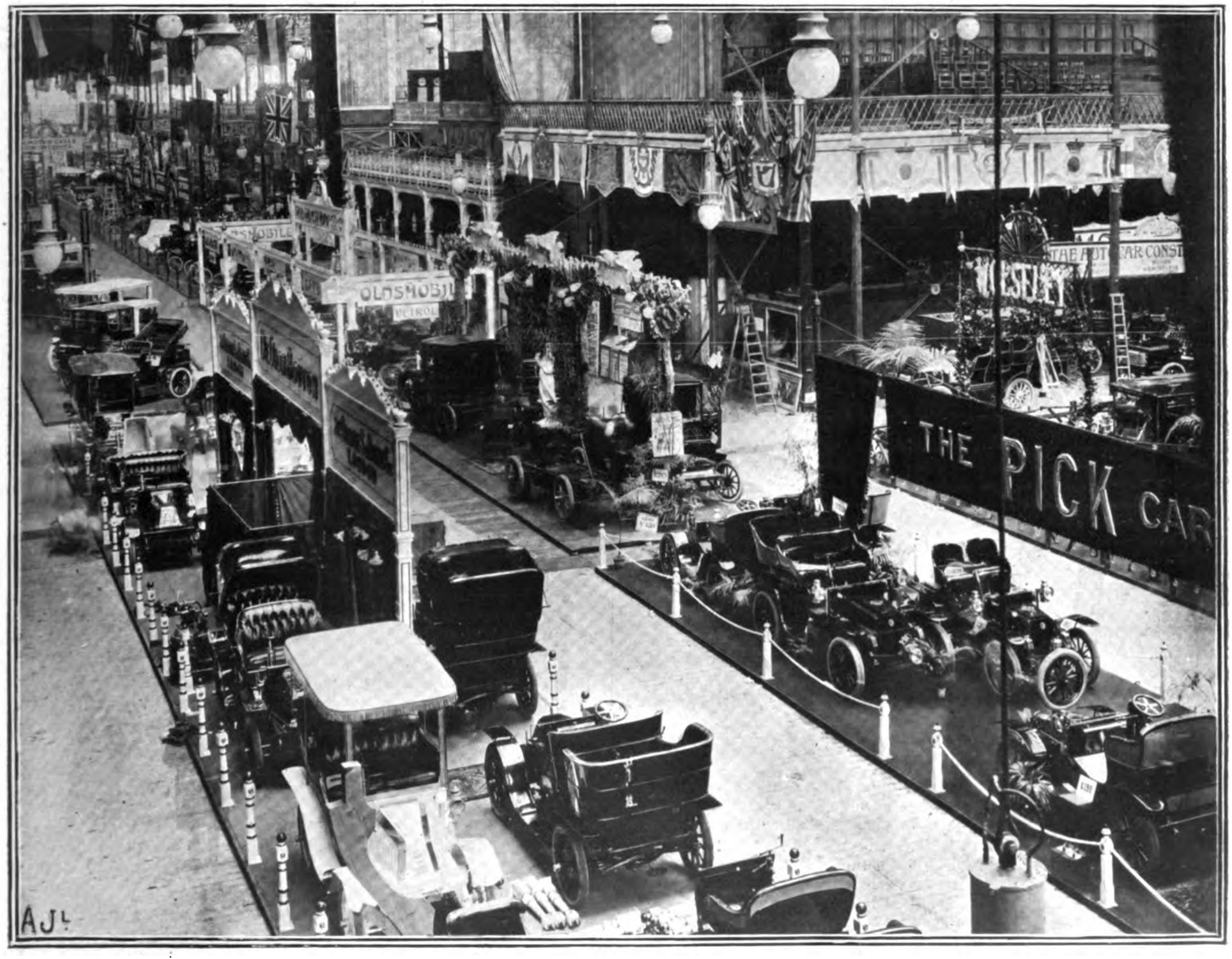

THE CRYSTAL PALACE AUTOMOBILE EXHIBITION.—GENERAL VIEW OF A SMALL PART OF THE MAIN BUILDING.

THE AUTOMOTOR JOURNAL.

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Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

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DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.

Feb. 13	"Motor Cars as Feeders for Railways." Paper by the Hon. J. Scott Montagu.
Feb. 20	"Motor Bicycles." Paper by Mr. Mervyn O'Gorman.
Feb. 27	"Recent Development in the Modern Automobile." Paper by Mr. H. R. Sennett. Annual General Meeting.
March 13... ...	"The Motor Problem a Road Problem." Paper by Mr. W. Rees Jeffreys.
August	Tourist Motor Bicycle Reliability Trial.
September ...	The 1,000 Miles Trial.
1904 ...	Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.

Feb. 6–14 ...	Edinburgh Motor and Cycle Show.
Feb. 7–16 ...	Brussels Automobile Salon.
Feb. 9	Competition of Timing Apparatus (A.C. de F.).
Feb. 13–21 ...	Manchester Cycle and Motor Show.
Feb. 19	Consumption Trials (100 kiloms.) *L'Auto.*
Feb. 22–28 ...	Pau Automobile Week.
March	Competition of Silencers (A.C. de F.)
March	"Criterium du Quart de Litre" (*L'Auto.*)
March 8–22 ...	Berlin Automobile Exhibition.
March 16–30 ...	Vienna Automobile Exhibition.
March 20–28 ...	"Criterium des Transports Automobiles." 1,107 kiloms. (*La France Automobile*).
March 21–28 ...	Cordingley and Co.'s Exhibition, Agricultural Hall.
March 28–April 5	Nice Automobile Week.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 24	Paris–Madrid (A.C. de France). Entries until May 15. Double fees April 16 to May 15.
May or June ...	Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18–23 ...	Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 25–July 1 ...	Aix-les-Bains Auto Week (Auto Club du Rhone).
July 9	Gordon-Bennett Cup Race.
July 19	Circuit Francaise. 400 kiloms. (Chambre Syndicale de l'Automobile).
August	Circuit des Ardennes.
September ...	Udine Exhibition (Italy).
Oct. 15–21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

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PASSING EVENTS.

THE CRYSTAL PALACE SHOW.

THERE is no doubt about it that the Palace Exhibition forms the most impressive and imposing show of automobiles that has ever been collected together in one place in this country, or probably in any other. The impressive effect is undoubtedly heightened by the assemblage of all the principal exhibits in one long vista in the immense nave of the Crystal Palace. In this respect it is more impressive than the Paris Exhibition, and the numbers and importance of the exhibits themselves are not inferior. It is a pity, therefore, that the authorities thought fit to mar to a certain extent the general effect—and, certainly, the effect of the view obtainable from under the clock at the southern gallery—by the suspension of a series of sail-cloth awnings not conspicuous for their newness or cleanliness, and hung at just sufficient elevation to destroy the effect produced by the fine height of the building. The early February sun is never sufficiently powerful to be a serious inconvenience even in the Crystal Palace, and no building in Europe would have afforded such a view as would have been obtainable if these badly-preserved awnings had been omitted. The Exhibition has been exceedingly well patronised by the public up to the time of going to press. On Saturday, for instance, the numbers admitted amounted to 32,000, and the class of visitor was distinctly above the average in intelligence and, apparently, in social position. A good deal has been said about the Crystal Palace being too far removed from the centre of London for a Show there to be well patronised. The present Exhibition has demonstrated the fallacy of that contention, or if not, it has triumphantly shown that the attractive powers of a motor car show are capable of more than counterbalancing any disadvantage that may be due to the remoteness of the situation and the imperfections of the train service, which are much the same as they always have been, and apparently always will be, while the two existing lines enjoy the monopoly.

Of course, one of the main features of the Exhibition, and the one in which a show at the Crystal Palace is naturally pre-eminent, was provided by the demonstration cars running in the grounds. These were mostly assembled on the terrace between the Palace and the North Tower, but they took runs all over the grounds and were able to give very pretty demonstrations of the controllability of the modern car round sharp corners and down steep hills on the road between the North Tower and the reservoir, while the return journeys afforded excellent demonstrations of hill-climbing capabilities. Some very fine displays of expert steering were given at this corner, and sometimes things looked a little risky, but thanks to the assistance of a man with a red flag stationed at this point nothing ever happened. This man with the red flag was himself an interesting exhibit. He recalled forcibly the old bad days when a similar functionary was compelled by the wisdom of our legislators to walk in front of every self-propelled vehicle in the country.

Coming so soon after the Paris Exhibition the present Show cannot boast of such a variety of startling novelties. Compared with the last Exhibition at the Agricultural Hall, the same features of novelty which we described and dealt with in connection with the Paris Salon are in evidence, and many original English cars are shown. Great evidence of solid British progress is afforded, and a greater number of well-designed, well-built and highly-finished British cars were in evidence than ever before. Increased excellence of finish and workmanship was notably displayed in the heavy steam lurries—that line of manufacture which British builders have made so particularly and triumphantly their own.

Altogether the organisers of the Exhibition and the Crystal Palace Company are to be congratulated on the splendid success of the Show. It is brilliant in every sense of the word, particularly so at night, as will be readily believed from the circumstance that the consumption of gas and electric current for lighting the stalls alone is enormously in excess of that employed for the ordinary lighting of the building.

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THE GORDON-BENNETT PROSPECTS UP TO DATE.

If anything occurs to prevent the Gordon-Bennett Race being successfully held in Ireland it will certainly not be the fault of the Club Secretary, or for that matter of any of the other interested gentlemen who are so ably and vigorously supporting him. His energy on behalf of the cause is little short of phenomenal. Conducted by Mr. W. G. D. Goff, Chairman of the Committee of the Irish Automobile Club, he spent Friday and Saturday of last week in working up the district with as much enthusiasm as an electioneering agent, and in paying a series of judiciously-selected visits. He called upon the Bishop of Kildare, the Chairman of the Carlow District Council, the parish priest of Naas, several other local clergymen, on the County Surveyor, the Chairman of the Kildare County Council, and the local member of Parliament. Everyone of these personages proved themselves most enthusiastic supporters of the project, and it is pleasing to find that the Bishop of Kildare has been addressing meetings in favour of the race besides writing the letter to which we referred last week. In fact the prospect appears most encouraging, so much so indeed that the Executive Committee decided last Monday that the competing Clubs should be asked to agree to Thursday, the 9th July, being fixed for the race. Of course there is still the enabling Bill to be passed, but with the amount of local enthusiasm in favour of the race, and the petition now being prepared, which there is every ground to think will be most numerously and influentially signed, there are good reasons for hoping that an official Government Bill may be introduced. In this case Mr. Scott Montagu, who is always willing to oblige, will stand aside with his proposed enabling Bill, the introduction of which will then of course become unnecessary. Though now being prepared, this petition is not yet quite ready for signature, but promises to sign it have been received from most influential quarters. Amongst these is the Secretary of the Great Northern Railway Company of Ireland, who is authorised to sign on behalf of the Company, the Dublin, Wicklow, and Wexford Railway Company, the Midland Great Western Company, and a number of smaller railway companies, together with the Tourist Development (Ireland), Limited. Favourable replies have also been received from a number of parish priests, magistrates, landed gentry, and noblemen, and from the chairmen of nearly all the remaining County Councils in any way interested, and from the Dublin Corporation, together with a great many other public bodies and individuals too numerous to mention.

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LUBRICATION.

There are few matters of more importance or interest to the automobilist than lubrication. On it depends the successful running of his car, or indeed its running at all, and on the excellence with which the lubrication is effected depends a very large proportion of the wear and tear of the moving parts—one of the most potent causes of ageing and deterioration. Mr. Clarkson therefore had an excellent subject for his recent paper before the Automobile Club, and as he is himself an expert, who has spent much time and capital on the subject, his conclusions are of considerable value and interest. Of course Mr. Clarkson, like many experts, has a boat of his own, and many of his conclusions are specially applicable to his particular steam system. He has his own system of lubrication, and a special lubricator, on which he pins his faith. His abbreviated paper, with illustrations, is given elsewhere, and our readers will see that there is much to be said for his arrangement, as it is based on common-sense principles, and much also to be said for the manner in which it is carried out. Mr. Clarkson's paper naturally led up and formed an introduction to his own system, although it dealt with the general principles of lubrication. This subject was attractively dealt with, but we feel that there are a good many amateurs, at any rate, who might fail to grasp Mr. Clarkson's way of putting things. You cannot annihilate energy in this universe; you can only transfer it. When a projectile strikes the armour-plating of an ironclad motion appears to be arrested, but it is not really so. The *molar* movement of the projectile is split up into *molecular* movement in the substance of both, and this we know as heat. It is sometimes sufficiently intense to cause fusion of the metal. When two surfaces are rubbed upon one another there is the same tendency to stop ordinary motion and convert it into heat. Mr. Clarkson's view is that the amount of heat generated is proportional to the extent to which the rubbing surfaces inter-penetrate one another. Without making this assumption it is, at any rate, certain that the harder and smoother the rubbing surfaces are, the less as a rule is the friction they produce. Other things being equal the amount of heating the friction causes is directly proportional to the amount of surface exposed, and to the pressure between them. This gives rise to some misunderstanding. The notion has become prevalent that friction is diminished by a large bearing surface. It is often so under working conditions, but it is not so theoretically with a given pressure on a bearing; the smaller the bearing the less, at any rate if unlubricated, the friction. By making a bearing ample, however, the heat generated by the friction is spread over a larger surface, and so though the total heating and friction may be greater, the heating, say per square inch of bearing, is less, and heating up is prevented.

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When we come to deal with the question of lubricating bearings, the problem is complicated by another set of considerations. Lubrication consists in maintaining a film of viscous liquid between the rubbing surfaces. The particles of a liquid move over one another with a certain amount of freedom, and, consequently, as long as the liquid is present between the bearing surfaces, the effect is similar to that of introducing a series of tiny balls or rollers between the two. The liquid must be viscous in order to ensure its staying there for a certain length of time. If the liquid could not get out of the bearings, it might be possible to lubricate them with water. Viscosity might be roughly defined as the slowness of flow of a liquid. Consequently the longer it has to stay in the bearings, and the greater the pressure on the bearings, the more viscuous the lubricating oil ought to be. This, however, means limiting the speed of driving. Consequently the slower the speed the thicker the oil we can employ. If the speed is too high for the oil friction between oil and axle will drag the oil off the bearing surface and cause friction and heating. For very high speeds, therefore, thinner oil would have to be used. In fact, oil so thin that it would not give satisfactory results at the low speeds and high pressures is alone suitable for high speeds and the corresponding lighter bearing pressure. These views of the subject are excellently put out in a little book written for the Vacuum Oil Company by J. E. Powers, and entitled "Reducing Friction." Taken in conjunction with Mr. Clarkson's Lecture, the two cover the subject of lubrication very thoroughly from the popular point of view, and we would recommend those of our readers interested in the subject to read both together. Everyone will agree, however, with the excellence of the principles Mr. Clarkson enunciates—lubricating, that is to say, by delivering the whole feed to the different bearings for short intervals consecutively.

SYNCHRONISING THE SPARK IN CYLINDERS.

Where there is more than one vibrating contact breaker and induction-coil producing the sparks in the cylinders of a multi-cylinder petrol engine, there are certain difficulties encountered in getting the spark to take place at the same corresponding instant in each of the cylinders, and any want of synchronism is bound to result in loss of power. In the first place, it is very difficult to get the contacts on the commutator to make contact with their springs at instants corresponding exactly to the same part of the stroke in each of the cylinders, and even if this is done, each of the tremblers on the coils (when such are used) has a certain lag of its own—a certain personal equation, in fact—which requires adjustment. These difficulties have been surmounted in two recent cars at present at the Palace Exhibition, in quite different ways. Messrs. Wilson and Pilcher employ one trembler and one condenser for all four cylinders of the engine, with a commutator of special construction which makes contact at exactly the same angular interval for each of the four cylinders. There is no necessity to adjust the trembler with any very great care, because only one is used for all the four coils. The Chenard and Walcker system gets round the difficulty in a 2-cylinder engine by arranging the two ignition plugs in series with one another, one induction coil and trembler alone being used. The relative instant at which the spark takes place is therefore bound to be identical in the two cylinders provided that the cam on the half-speed shaft is correctly made, and there is no difficulty in constructing such a cam with its two projections accurate. Of course, in the one cylinder no explosion takes place and the spark occurs at a time when there is practically no pressure in that cylinder.

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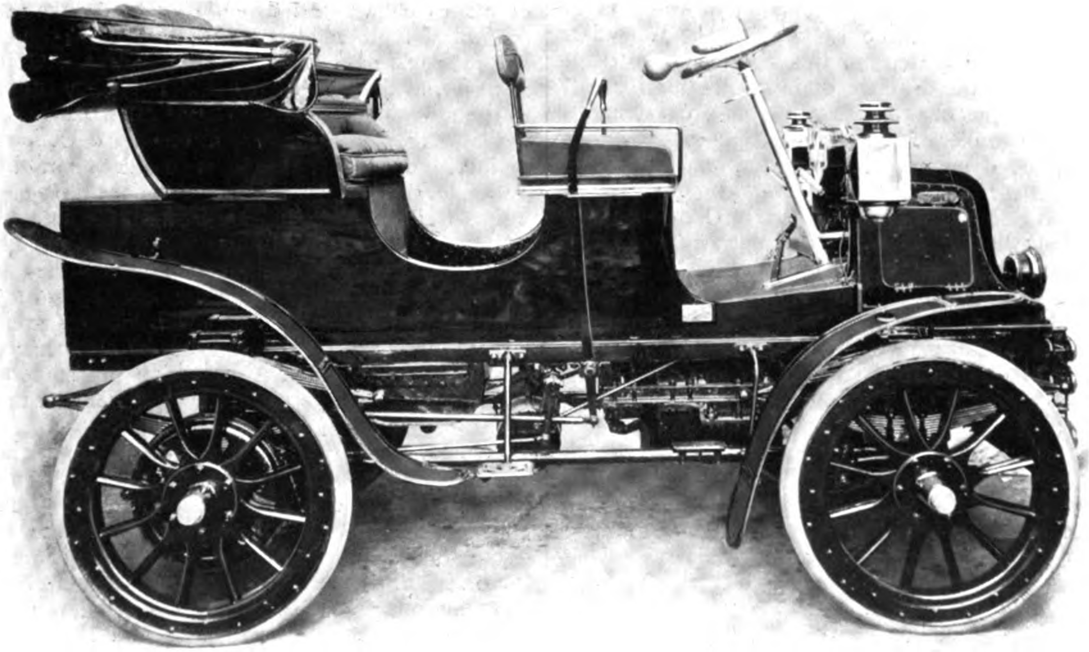
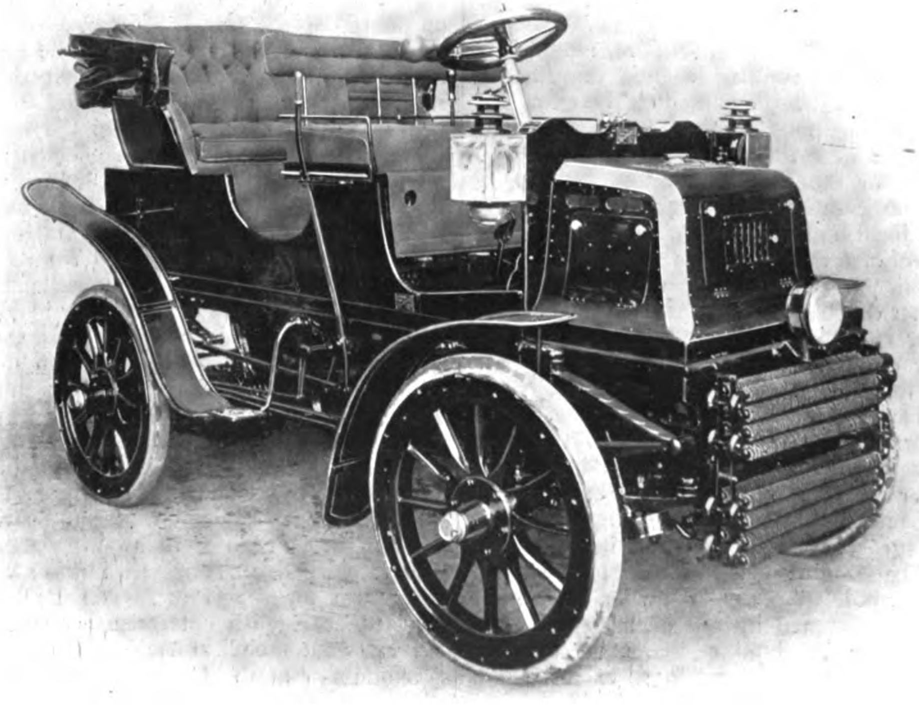
A curious incidental effect is obtained by the employment of the double spark in the Chenard and Walcker method. The idle spark operates as a spark gap in series with the working spark in the same way as the air gap in the new Panhard sparking plug, and has a similar effect in enabling the engine to run even when the spark plug is dirty. A great deal of mystery has been made out of this very simple phenomenon. It is only a practical application to engine ignition of what electricians know as the phenomenon of the alternative path, so clearly described by Sir Oliver Lodge in his "Modern Views of Electricity," published upwards of fifteen years ago. The extra spark gap ensures the discharge being "disruptive," that is to say, a series of discharges backwards and forwards of enormous rapidity. If there is a short circuit or a shunt owing to dirt on the sparking plug the disruptive discharge cannot occur. The extra spark-gap consequently merely ensures that the discharge shall always be disruptive. Now, a disruptive discharge does not take the path of least ohmic resistance, but jumps across that part of the circuit where there is least "impedance." Thus, if a copper wire be bent round, its two ends provided with polished balls and used to discharge a Leyden jar, the discharge will jump across between the two balls instead of going round by the copper wire. This is what happens in the case of the carbonised plug. When the discharge is not disruptive—that is to say, when there is no extra spark-gap—the current passes by the carbon. When the discharge is disruptive, it jumps across between the ordinary sparking points, owing to the impedance of the carbon. It follows consequently that the extra spark enables the engine to run with a dirty spark-plug.

THE CITY AND SUBURBAN PETROL-ELECTRIC CAR *(See next page).*





THE CITY AND SUBURBAN PETROL-ELECTRIC CAR.

INTEREST in the combination of the petrol engine with a system of transmission comprising the main features of the ordinary electric vehicle appears to be steadily on the increase. We have already in the columns of the Journal described the Champrobert, the Lohner-Porsche-Mercedes, and Kriéger combined vehicles of this class, and we dealt at some length with the Fischer omnibus in our issue of June 14th, which is, as our readers are aware, conspicuous as a practical example of the combined employment of the petrol engine, dynamo, electric motor, and battery of accumulators for car propulsion.

The City and Suburban Electric Carriage Company, who may be regarded as the pioneers of successful electric automobilism in this country, are also putting vehicles of this kind on the market. The first combined petrol-electric car which has been built by them is, to a certain extent, an experimental vehicle, though it has given a good account of itself on the road, and its performances have been so satisfactory that the Company are following up its construction by building two further vehicles on the same principle, but of considerably greater power. This car, which is on exhibition at the Crystal Palace Show, was referred to briefly by us in our last issue, and we are now able to give our promised illustrated description of it. The combined petrol-electric car is, as may be seen from the accompanying illustration, of the four-seated double phaeton class, the back seat being provided with a hood. The battery is fitted underneath the rear seat in a compact "boot"; it consists of 44 small cells of 70 ampère-hour capacity. The chassis itself consists of two frames, an upper one of channel steel carrying the battery box above referred to, the car body, the dynamo or generator, and the petrol motor. This upper frame, which as it were forms a chassis in itself, is mounted by double elliptical springs on the lower tubular framework, which is practically identical with that rendered familiar by the City and Suburban Company's electric broughams; that is to say, it consists of front and rear axles connected by jointed tubular reaches, the electric motors which drive the car being mounted on the rear axle, and driving the rear wheels by means of pinions which engage with protected gear rings rigid with the wheels. The outer periphery of these gear rings forms the brake drums on which compensated band brakes, operated by hand, work. Additional brakes acting on the motor shafts are under the control of a foot lever immediately under the driver's seat, the first movement of which cuts off the current, while further depressing it applies the brakes.

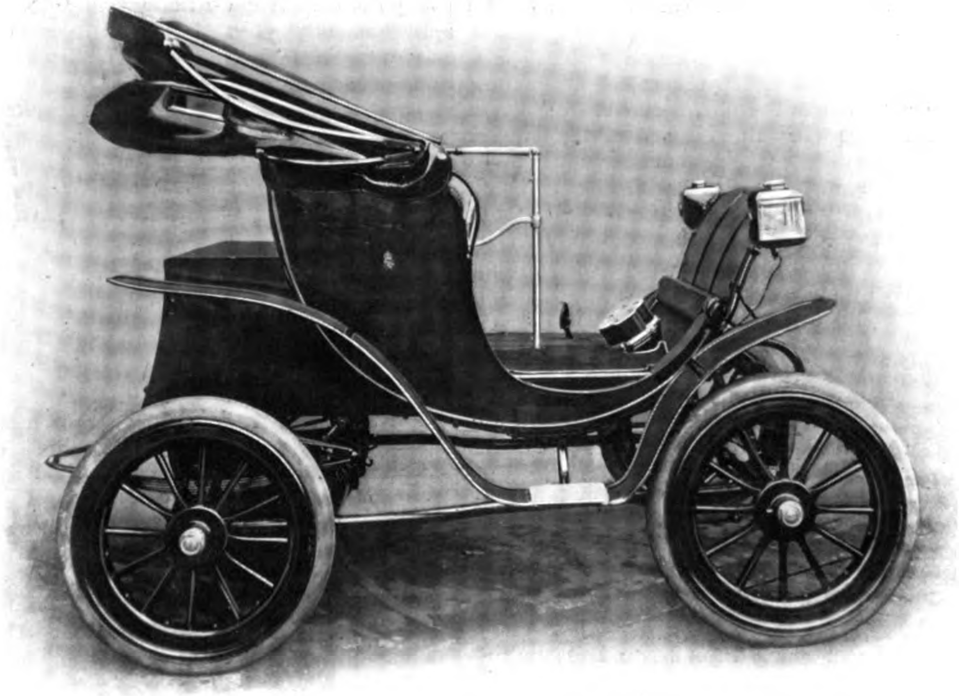
The petrol motor is mounted on the forward end of the upper frame under the bonnet in the way usual in most petrol cars. It is a 5½-h.p. twin cylinder Daimler, set longitudinally and provided with high tension electric ignition and a governor of the ordinary type. The engine is controlled by two handles mounted on either side of the raked steering pillar immediately below the steering wheel, one of these hand levers advancing or retarding the spark, and the other acting as accelerator by operating upon the governor spring. The engine shaft lies longitudinally, and is coupled to a four-pole 5-h.p. dynamo, which is fixed in the position usually occupied by the change-speed-gear. The coupling is made by bolting the male member of the old clutch to the female portion so as to form a flexible coupling between the dynamo and the engine. Dynamo, motors. and batteries are, as in the Fischer omnibus, all in parallel with one another, the battery thus acting as a flywheel, and taking up energy from the dynamo when the load on the car is small, and assisting the dynamo to drive the motors when the load on the car increases. Under ordinary circumstances, when running on the flat, the output of engine and dynamo is greater than the amount of current required by the motors to drive the car, and the batteries consequently receive a charge. Going up hill, however, as the load increases, the battery supplies current to the motors, and as these latter are capable of withstanding an overload of upwards of 100 per cent. for a moderate period, more than 12-h.p. is under such circumstances available, the motors being rated at 3-h.p each. As the weight of the vehicle is considerably less than that of an ordinary electric car of the same size, its hill-climbing powers are highly satisfactory. The batteries are capable of running the car without the assistance of the engine some twenty miles on the level. When going through traffic, therefore, the engine can be stopped entirely and the vehicle proceed on its way with the smooth and silent running for which the electric broughams of the Company are so favourably noted.

Whenever it is desired to re-start the engine and dynamo the process requires no manual effort. A small starting resistance with a number of contacts is mounted on the dashboard, the dynamo is switched on to the cells, the resistance being in its armature circuit, and it then starts as a motor. As its speed increases, and the petrol engine takes its explosions, the resistance is cut out gradually and the dynamo then acts as a generator and supplies current to the battery and motor circuit.

The methods of controlling the motors are identical with those employed in the City and Suburban electric broughams, that is to say, a horizontal cylindrical controller mounted under the driver's seat is operated by a side lever projecting upwards through the woodwork of the seat between the cushions. A main switch plug is also provided on the top of the seat, the removal of which renders the starting of the car impossible. The steering differs, however, by the substitution of an inclined steering pillar and wheel for the tiller usual on the broughams. The different positions of the controller group the motors so as to give three speeds, while reversing is effected in the usual way by a change-over switch. We are informed that this car has given a very good account of itself in actual use on the road. It has run long distances in Devonshire and made what was practically a non-stop run of 80 miles. It has made the run from London to Brighton, including some short stoppages (not for repairs), in three hours and a half. The battery is considered by the Company rather excessive, and will be diminished in the case of the two vehicles which they are now building on the same principle. These will be equipped with 12-h.p. petrol motors and corresponding dynamos and electric motors.

Most of the running gear, with the exception of the motors, of the Company's carriages is now being constructed at the Clapham works, and several very attractive-looking broughams were awaiting the finishing touches when we called. Amongst these was a very *recherché* yellow brougham for the Princess de Polignac, a satisfactory proof that English enterprise is getting a footing in the capital of automobilism itself. We also noticed the Queen's Victoria now at the Crystal Palace, which is illustrated on the opposite page.

THE AUTOMOBILE SHOW AT THE CRYSTAL PALACE.—PART I.



Queen Alexandra's Electric Victoria, built by the City and Suburban Electric Carriage Company.

THE Exhibition at the Crystal Palace has proved to be an even greater success than was anticipated, and its organisers have good grounds for claiming that it is the largest and best attended automobile show which has up to now been held in any country. The entire available space in this large building was filled with the numerous exhibits, the majority of which consisted of self-propelled vehicles of one type and another, and a comparatively small proportion being occupied by automobile accessories of all kinds. It was evident from the first that a good attendance of the public was all that was required in order to make the exhibition satisfactory to everyone, and up to the time of writing, at any rate, there has been nothing lacking in this respect. It is seldom that the Crystal Palace is so crowded with visitors as it has been since Friday of last week, and it is some time since any exhibition in the neighbourhood of London has attracted so much attention from the general public. Considering the distance from London and the time taken in getting to and from the Palace, it is evident that the utility of, and even necessity for the automobile is being more and more widely recognised as time goes on. At previous shows it has been difficult to say how far the visitors have been merely prompted by an almost idle curiosity and a mere wish to see what the machines, which are ultimately to become the new form of locomotion, look like. On the present occasion, however, it is hardly likely that anyone would undertake the trip to the Palace unless they took a more serious interest, and at any rate considered that there was a chance of their becoming motorists, or of employing automotors in their business at no very distant date. This view of the case is, moreover, fully borne out by the general tendency of the conversations which we have overheard at the various stalls during the week and by the questions which have been put by the visitors to those in charge of the exhibits. It is certain that the public have taken the unique opportunity which has been given them for inspecting and comparing the very best self-propelled vehicles of all kinds which are made, and that a considerable amount of business has been done.

As indicated by us last week in our forecast of the Exhibition, every kind of automobile is on view, including those driven by steam, petrol, and electricity, and varying in size from heavy lurries for the transportation of loads of ten tons and over, down to bicycles equipped with engines of small power. Although vehicles for pleasure purposes are in the majority, yet vehicles specially constructed for commercial use are also shown. The latter are for the most part intended for exceptionally heavy traffic, and except for the Milnes-Daimler vans, lurries, and 'buses, there are but few as yet which are propelled by petrol motors. We are glad to think, however, that this important branch of the industry is now receiving the attention of many well-known makers, although the manufacture of such conveyances is attended with a certain amount of difficulty, and has in the past been largely neglected owing to the greater attractions which are apparently presented by catering for those who adopt automobilism as a sport. The public have also been afforded an opportunity of seeing many of the fastest racing vehicles, many of them historic, upon which existing records have from time to time been broken, and important races won. The progress which has been made during the past few years is well shown by some of these, a few such being the Panhard and Levassor $3\frac{1}{4}$-h.p. winner of the Paris-Bordeaux race in 1895, which maintained an average speed of 12 miles an hour, the 60-h.p. new racing car also shown by the owner, the Hon. C. S. Rolls, which established a world's record of 29 secs. for the kilometre, the Napier Gordon-Bennett winner of last year's great race, and one of the Flying Darracqs, shown by Mr. E. W. Hart as being the fastest long-distance car in the Exhibition. By the way of contrast to the racing vehicles, and as showing the far-reaching application of motors, the self-propelled mowing machines exhibited by Ransomes, Sims and Jefferies, Limited, may be mentioned.

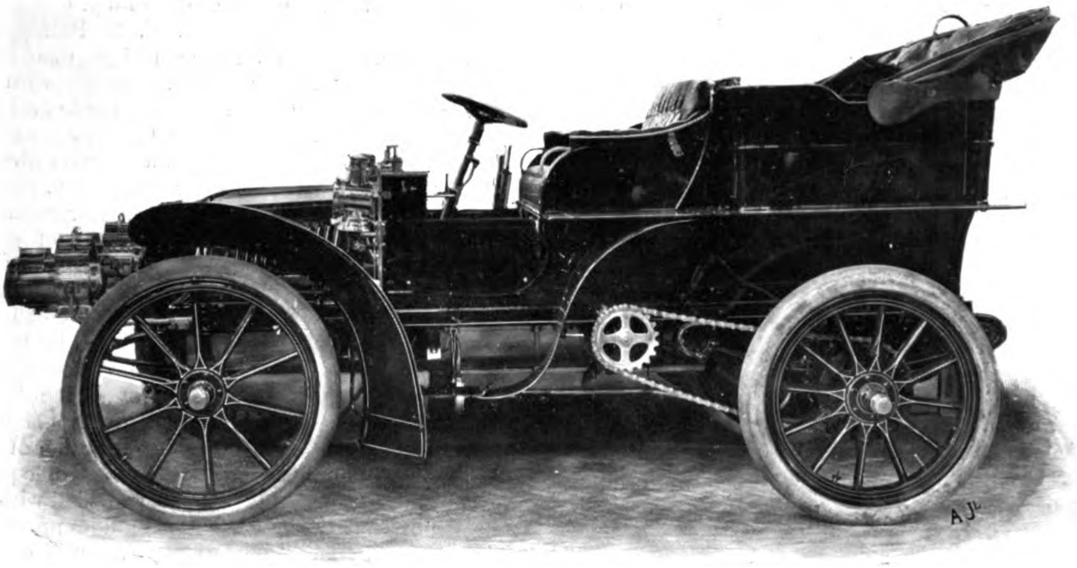
The unique advantages of the Crystal Palace for an automobile show were very fully taken advantage of by the exhibitors, and the grounds were used for giving practical demonstrations of the capabilities of a large number of the cars. The public were not slow to take advantage of the excellent opportunity which was offered to them, and it was evident that they fully appreciated the relaxation and change of scene thus afforded. Not only are the grounds admirably adapted for the purpose, owing to the great variation of gradient which is met with, but the immediate neighbourhood outside the grounds provides a severe and pleasant testing ground for hill-climbing capabilities.

One of the most pleasing facts brought to light by the show, and one which cannot fail to have impressed itself upon those who have attended previous exhibitions in London, is the progress which has been made by English manufacturers and the increased proportion of British cars which are on view. It is difficult to make any real comparison between this exhibition and the one held in Paris just before Christmas, but it is safe to say that the present show demonstrates marked improvements in English cars, in much the same way that the Salon emphasised the progressive policy of the Continental makers. As we pointed out in connection with the Salon, the majority of the exhibitors there had adopted new models, which were largely based upon the Mercedes 1902 design. We do not recognise this to anything like the same extent amongst English builders, although in some respects they have to a lesser degree modified their designs on what may be termed these "fashionable" lines. Although the majority of them do not make a distinctive type of car, yet many of them have not been content with copying existing cars, however good the speed performances of such machines may have been. They have instead studied the whole problem from a general engineering point of view, and have endeavoured to construct vehicles which will appeal specially to that very large class of would-be motorists to whom speed is of less importance than many other characteristics, such as silence and comfort.

In connection with petrol vehicles of English design and manufacture, it is noticeable that the leading makers adhere to their previous and well-tried practice, and have been in no great hurry to adopt the four chief features about which there has been so much controversy recently—the stamped steel frame, the mechanical inlet valve, the honeycomb radiator, and the magneto system of ignition—although they are in many cases prepared to fit some of them, if particularly required, and although we have reason to know that they have carefully considered these questions. The chief improvements which these firms have made is in the direction of simplification, and in rendering those parts which may require attention accessible with as little trouble as possible. A good many firms, however, are employing mechanically-operated inlet-valves on the larger sized engines, and not a few fit honeycomb radiators to their standard cars.

Several firms which have not previously built petrol cars are showing them for the first time, the most noticeable of these being the Thornycroft Company, the Langdon Davies Motor Company, and Weller Brothers, Limited, all of whose productions we shall describe in due course.

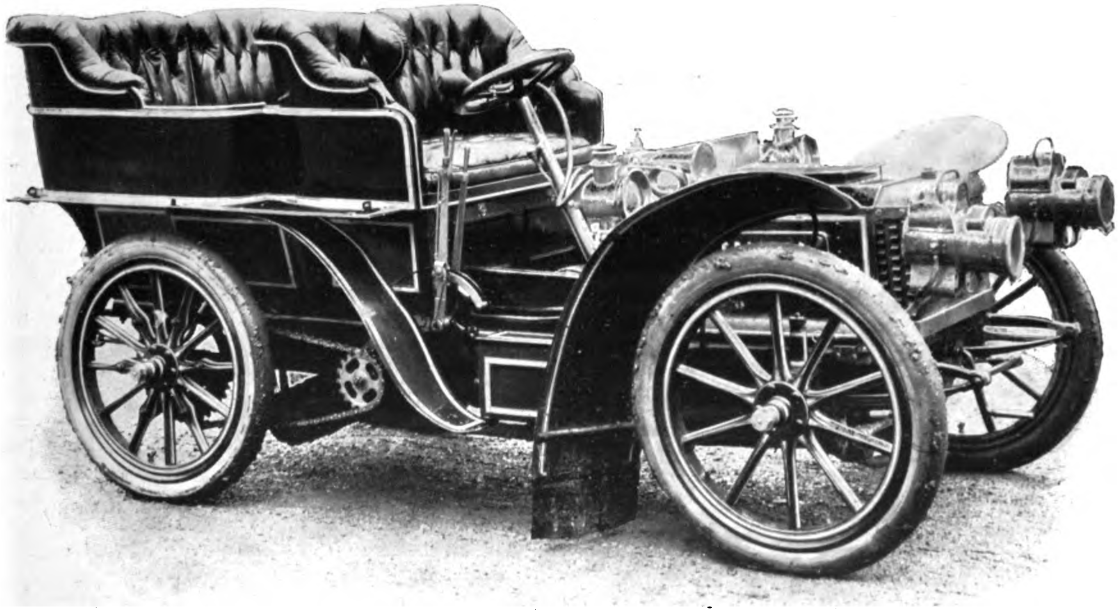
An inspection of the steam exhibits not only shows that English builders of the heavy steam trucks, as represented by the Thornycroft Company, the Straker Steam Vehicle Company, and Jesse Ellis and Co., and A. W. Brightmore, are maintaining English supremacy in this branch of the industry, but that steam cars for pleasure purposes have received a considerable amount of attention from British engineers. Not only were the British Power Traction and Lighting Company well represented with their Gardner-Serpollet vehicles, and the Clarkson Company, of Chelmsford, with their special machine, but the Motor Construction Company, of Nottingham, and the Albany Manufacturing Company, with their Lamplough-Albany car, have endeavoured to meet the requirements of the public and to compete with the popular American models by supplying vehicles of but slightly heavier construction. A large number of American vehicles were, as usual, shown, and there were many improved models to be seen. Several of the makers have introduced types which are more European in appearance and construction, the latest White model being particularly noticeable in this respect, and a new Locomobile fitted with wooden wheels, wheel-steering and additional side brakes on the rear wheels being shown. Two important improvements which are found on several of these American cars are the employment of superheaters in conjunction with the boilers, and the adoption of forced lubrication for feeding oil into the cylinders. The superheaters have been found to decrease the water consumption considerably, and the additional temperature of the steam in the cylinders is more or less responsible for the presence of a positive feed lubricator, although such a device is highly desirable under any conditions. The important question of using paraffin oil instead of petrol, as is done in the Serpollet and Clarkson cars, has also been recognised by many other makers, and is not only provided for on the vehicles of the Motor Construction Company and the Albany Manufacturing Company, but has been applied to several of the Weston cars in order to render them suitable for use in hot climates. The Hydroleum Company are showing their special system at their own stall, and the Weston cars are using the Johnston burner. Steam air pumps for maintaining the necessary pressure in the fuel tank are in many instances provided, and on the new Locomobiles are so fitted as to be available for inflating the tyres. Various forms of condenser are adopted, being generally employed merely for rendering the exhaust steam invisible, although it has been found that the superheater renders them unnecessary when it is fitted. Various attempts have been made to utilise the condensed water over again even on those light steam cars which have the ordinary fire tube boilers, and the Albany Company's



16-h.p. Napier Car built for the Rt. Hon. A. J. Balfour.

apparatus, as manufactured for a Locomobile, is shown on that stall.

Electric vehicles are better represented and are shown in greater variety than they have been for some little time past. The revival of energy in this direction is doubtless in large measure due to the successful working of the numerous electromobiles which have been run for some few years now by the City and Suburban Electric Carriage Company. It is probable that the increased facilities which exist for re-charging the accumulators, coupled with the low cost at which current can be obtained, is accountable for this, and we hope that this particularly comfortable and convenient type of carriage will prove itself successful on a large scale. The manufacturers are well acquainted with the conditions under which their cars can be worked satisfactorily, and fully realise the difficulties which have beset them in the past. There is no form of vehicle which appeals more thoroughly to the public when in working order, and it is well recognised that the only drawback to them lies in the battery, and chiefly in the proper care of it. All the well-known forms of vehicle are to be seen at the Exhibition, and there are many new forms as well. It will

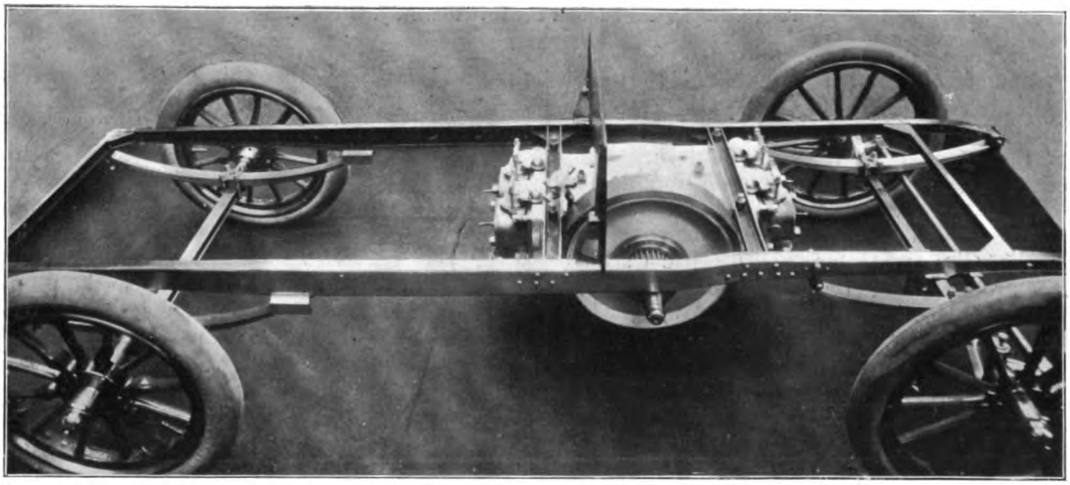


12-h.p. Napier Car with new Mulliner-Jarrott Tonneau Body.

be noted that lighter machines of the runabout type are being introduced to a considerable extent. The City and Suburban Company are showing some of these, and the Anglo-American Motor Car Company (Oldsmobile Company) are exhibiting the little Baker runabout. The Electromobile Company have several samples of their latest type of carriage, and Mr. E. W. Hart is also showing vehicles of somewhat similar construction. Cars of much heavier form are also to be seen, amongst which may be mentioned a large omnibus on the stall of the City and Suburban Company. The Vehicle Equipment Company's wagons are constructed for carrying loads of two and four tons respectively; photographs of them are shown on the Oldsmobile stand, although the actual cars have not arrived in time for the show. The City and Suburban Company exhibit the only car in which a combined petrol and electric system is employed.

A large number of the Continental vehicles which are shown by English agents were on view at the recent Paris Salon, and were dealt with by us in connection with that event. Other of these cars, besides several of British manufacture, have been recently described by us, either separately or in connection with the exhibition at Earl's Court, and our readers are, therefore, familiar with the main features of many of the vehicles at the Palace. The new models which are on view will be dealt with more fully subsequently, but can only receive brief mention at present.

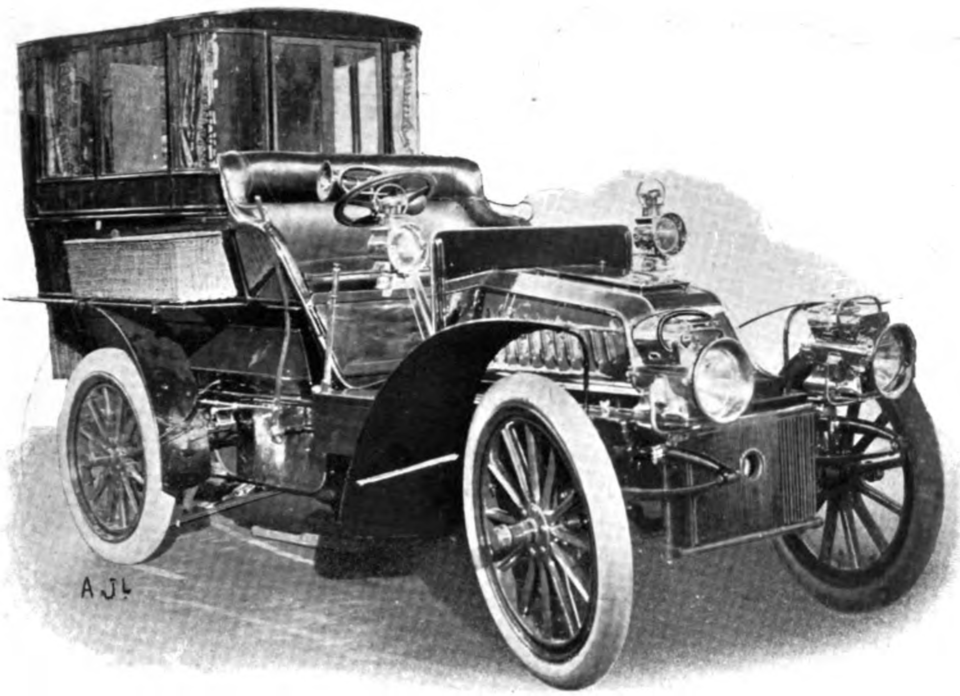
All the best known English makers had very complete and attractive stalls. The Daimler Company, S. F. Edge, Limited, and the Wolseley Company in particular. The excellence of finish and neatness of design in all three cases were patent to all. The Daimler cars built for His Majesty the King naturally attracted a good deal of attention, and the other 14 and 22-h.p. vehicles did not fail to make a very favourable impression. We mentioned several of the improvements which have been made by the Company in our last issue, and need only add that a fourth forward speed is now employed on the lower-powered model. Messrs. S. F. Edge's Napier cars in their glass houses were particularly attractive when illuminated at night, and the arrangement of mirrors around them enabled them to be seen from every point of view; a replica of the Gordon-Bennett Cup was shown alongside the now famous Gordon-Bennett car. The Right Hon. A. J. Balfour's 16-h.p. vehicle, the 20-h.p. chassis built for Mr. Lionel de Rothschild, Mr. F. S. Phillipson Stow's 16-h.p. vehicle, and two finished 12-h.p. machines of the new model in their Napier green, together with a chassis complete with its fan-cooled radiator, made an exceedingly attractive exhibit. The Wolseley Company made a very representative show, and exhibited a large number of their well-known cars. Their partly-finished 50-h.p. chassis which is constructed with a stamped nickel-steel frame and is fitted with a 4-cylinder engine, is a fine piece of work. The motor is in general design similar to their smaller 4-cylinder engines, and is fitted with a clutch and flywheel of considerable size. The inlet-valves are atmospherically operated, and the exhaust valves are normally closed by long flat leaf springs. The commutator is arranged so as to lie just beneath the sloping footboard in front of the driver. The engine is fixed to two cross members of channel steel, which lie above it and pass from one side to the other of the frame. The frame is stiffened at the corners by angle-plates, and the front ends of the rear springs are provided with hardened steel rollers, which are free to slide in guides provided on the underside of the frame. The axles have an H cross-section. The Company showed their 3-cylinder 45-h.p. racer, and have converted one of their 30-h.p. racing chassis into an uncommonly neat-looking touring tonneau. Their other cars, with the exception of a 22-h.p. omnibus, are of their well-known standard types, and are fitted with a variety of useful and well-finished bodies.



The 50-h.p. Wolseley Chassis with Nickel Steel Frame.

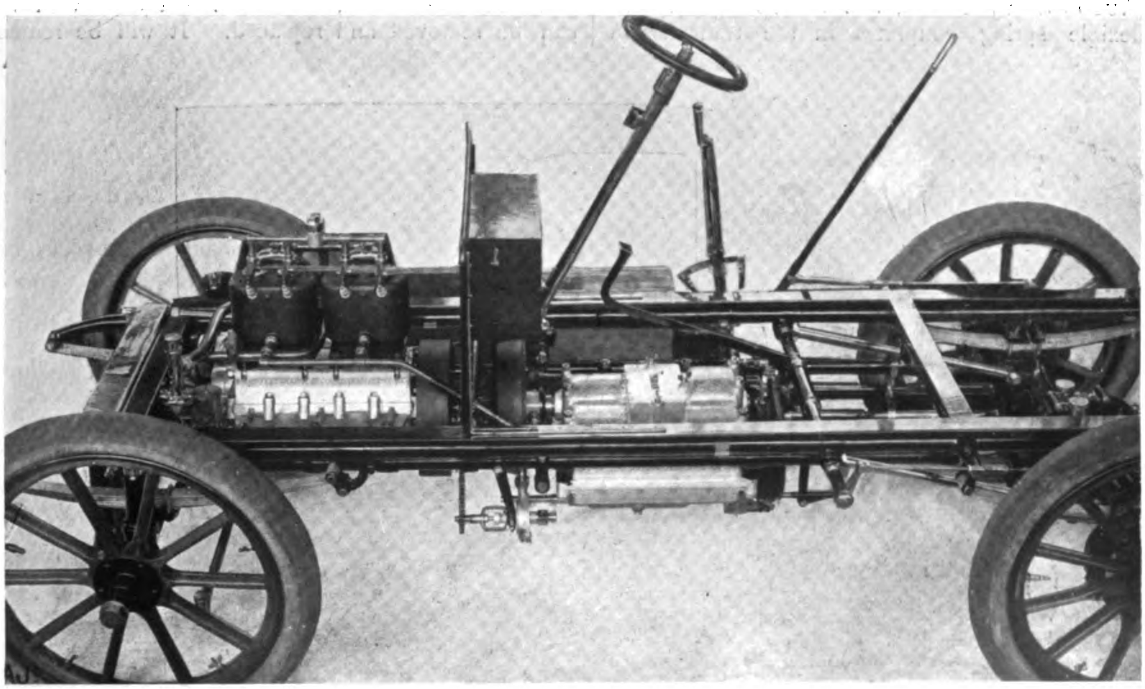
The New Orleans Company, although having only a small stand, showed two very well finished vehicles of their well-known design. The first one of these has a 4-cylinder 14-h.p. motor, and a change-speed gear giving four forward speeds and a reverse; the other is of the twin-cylinder type developing 9-h.p., and the gear-box has three forward speeds. The M.M.C. exhibit was as usual a large one, and, as at Earl's Court, the Company had several standard chassis and many well-finished cars on view.

Exceptionally well-finished chassis were shown by many English makers, those of the Ariel Company in particular being well calculated to show that in the matter of exhibition finish makers on this side of the Channel can hold their own against their Continental competitors. The Ariel Company showed their 10-h.p. (*see* Automotor

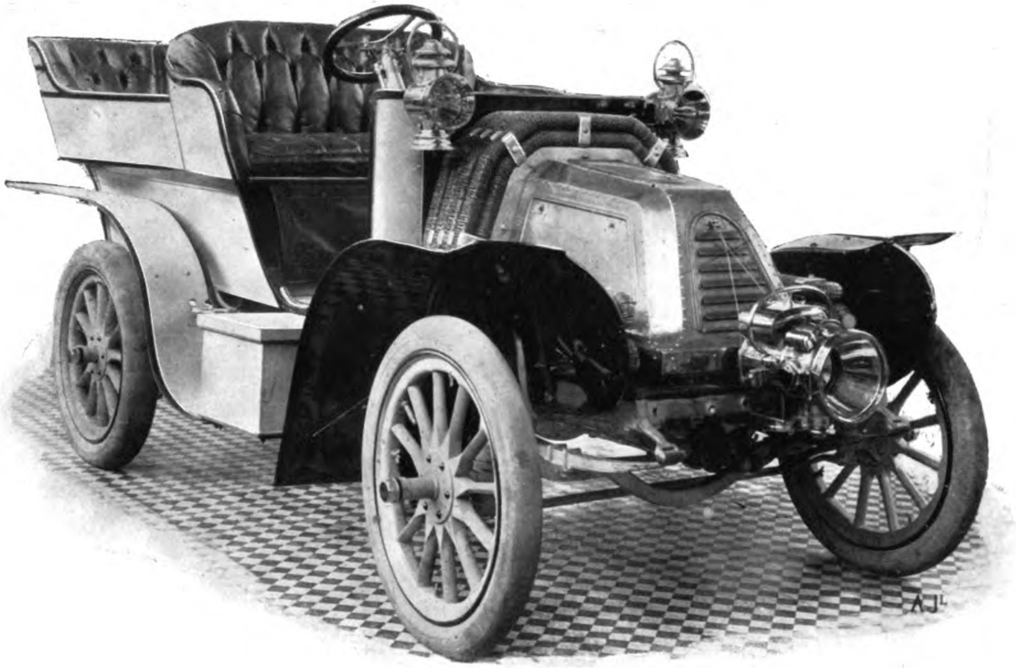


7-Seated Double Tonneau Ariel.

JOURNAL, Vol. VII., September 20th, 27th, October 4th), and 16-h.p. chassis, several finished cars, and various parts of the mechanism demonstrating the workmanship of their products. Messrs. Marshall and Co.'s standard Belsize 12-h.p. chassis (*see* AUTOMOTOR JOURNAL, Vol. VII., page 577) was also extremely well finished, its channel-frame being polished and the external metal work being calculated to attract the visitor. The makers showed two finished vehicles of the same pattern and a 20-h.p. vehicle having a 3-cylinder motor and an unusual type of transmission, which we shall refer to again later. A noticeable feature of their engines is that they are so designed as to be convertible in respect of the operation of the inlet valves; by the addition of a system of levers and cams, which can be bolted in place without further alteration, these valves are



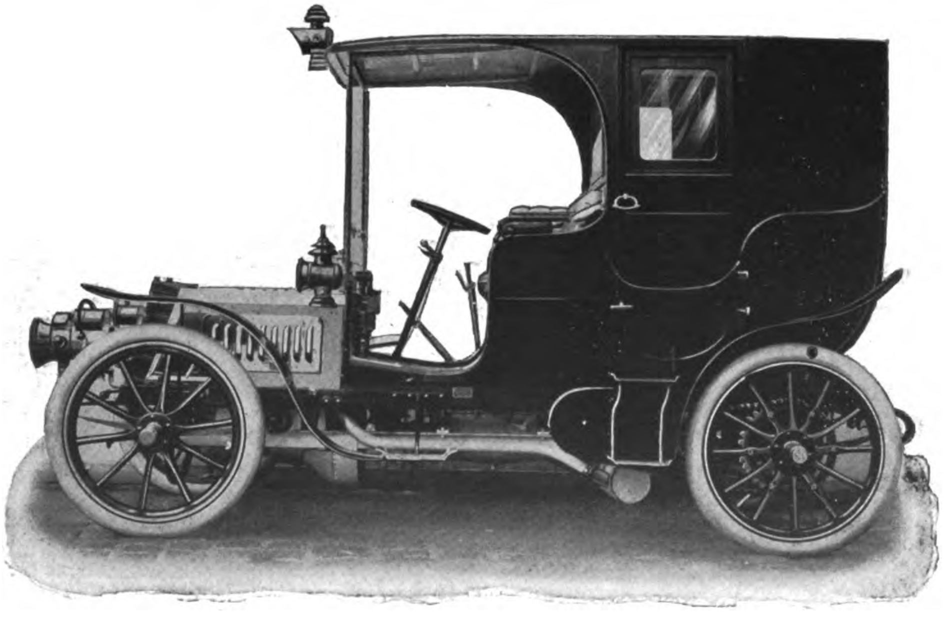
The 16-h.p. Ariel Chassis.



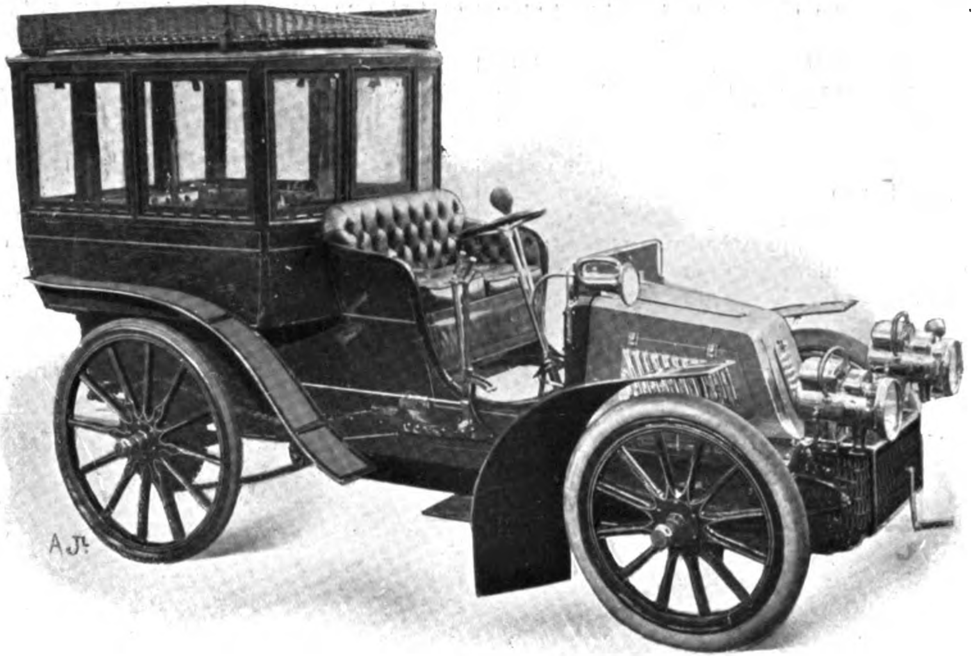
The Marshall (Belsize) Three-Cylinder 20-h.p. Car.

controlled mechanically instead of atmospherically. The 12-h.p. motor develops 16-h.p. on the brake. The 12-h.p. Sunbeam car, of John Marston (Limited), is a four-cylinder vehicle which it will be remembered was seen for the first time at the National Show last year; one of these cars was again on view, and its mechanism remains unaltered. Its high-class finish gives it a very pleasing appearance. The Dennis Company and the Albion Company, on their new 12-h.p. model (*see* AUTOMOTOR JOURNAL, Vol. VIII, page 16), have adopted flexible spring couplings in the transmission gear, in order to prevent sudden shocks from being transmitted between the engine and the driving wheels, just as is done in the new 12-h.p. Velox cars. Samples of all these three makes of cars were on view in prominent positions, all three companies being well represented.

The Brush Company made an attractive show with their well-known vehicles. Their 16-h.p. Diligence is placed beneath a framework, so that the detachable top is suspended above the car, showing the readiness with which it can be removed and replaced. It will be remembered



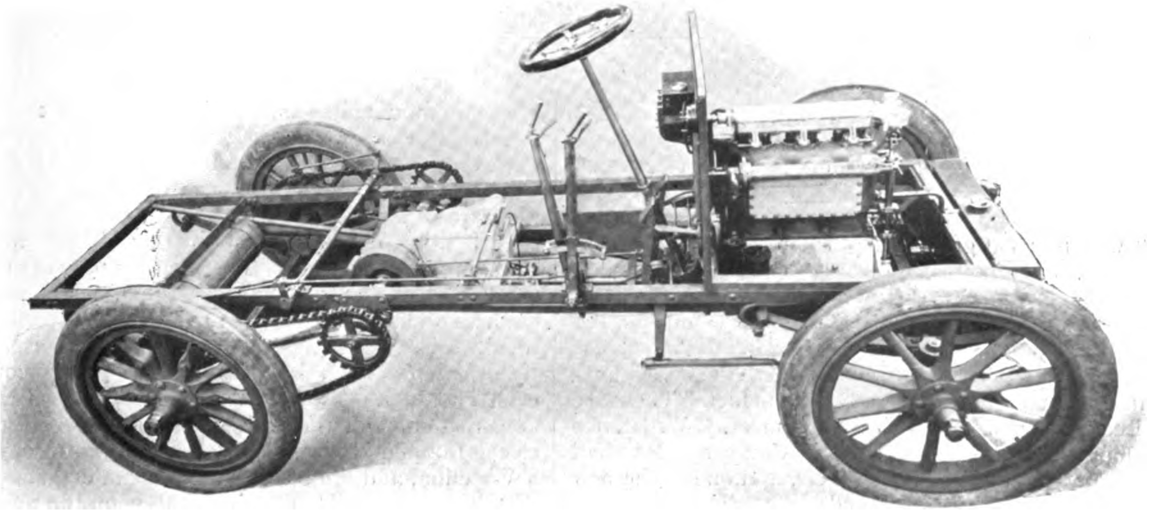
The Brush Company's 16-h.p. Diligence.



The 20-h.p. Maudslay Convertible Omnibus.

that this body is adapted for use in all kinds of weather, and enables different kinds of carriage to be combined in one. Some of the engines shown were fitted with mechanically-operated inlet valves, and many of the bodies were excellent examples of artistic carriage work.

The Rex Company showed two of their 10-h.p. single cylinder vehicles, the one fitted with a tonneau body and the other with a brougham. An interesting feature of these vehicles is that an automatic governor is provided which acts upon a throttle valve as with more powerful engines, and they have an accelerator as well. The addition of this governor is a decided improvement, although seldom found fitted to a single-cylinder engine; the Staughton Voiturette of the British Germain Company, which was again shown, is another small vehicle similarly equipped. Two larger Rex tonneaus of 14 and 16-h.p. respectively, both having twin-cylinder engines, had not arrived at the time of our last visit to the stall. The Century Engineering and Motor Company made a good show with their 6½-h.p. Voiturette and their 9 and 12-h.p. light cars, in all of which Aster engines are employed. A 12-h.p. Standard chassis was shown separately, and although similar in general respects to other chain-driven vehicles, its inspection could not but satisfy would-be purchasers. One of the interesting features

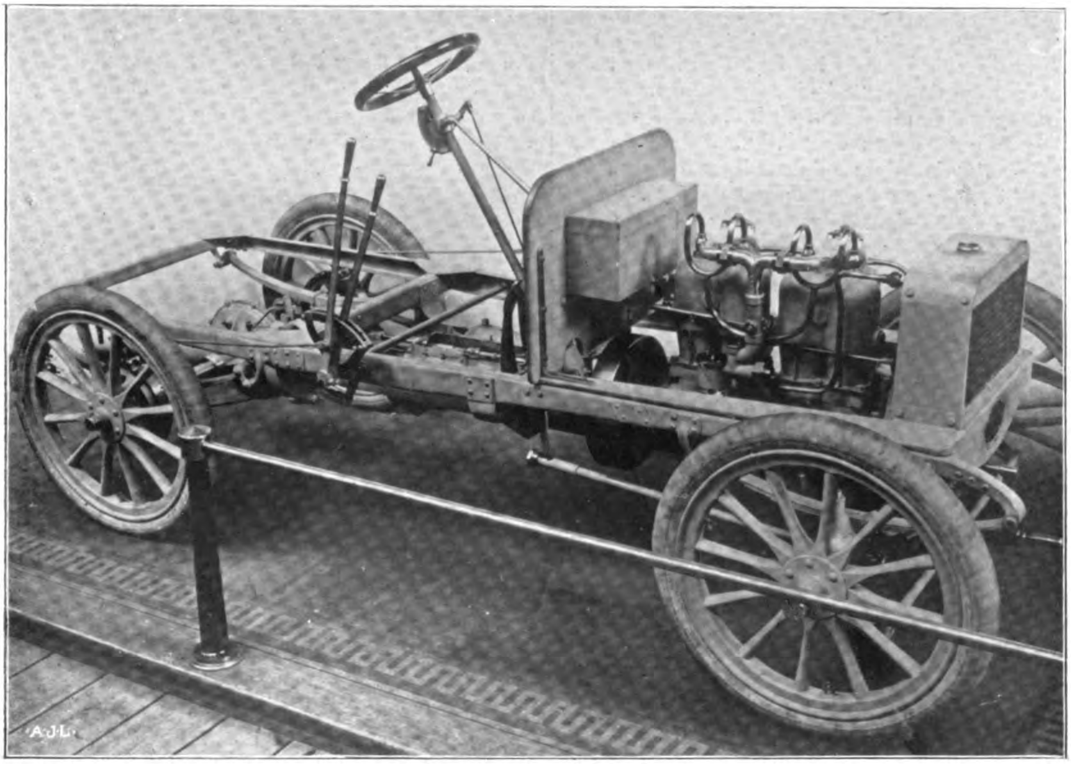


The 20-h.p. Maudslay Chassis—1903 type.

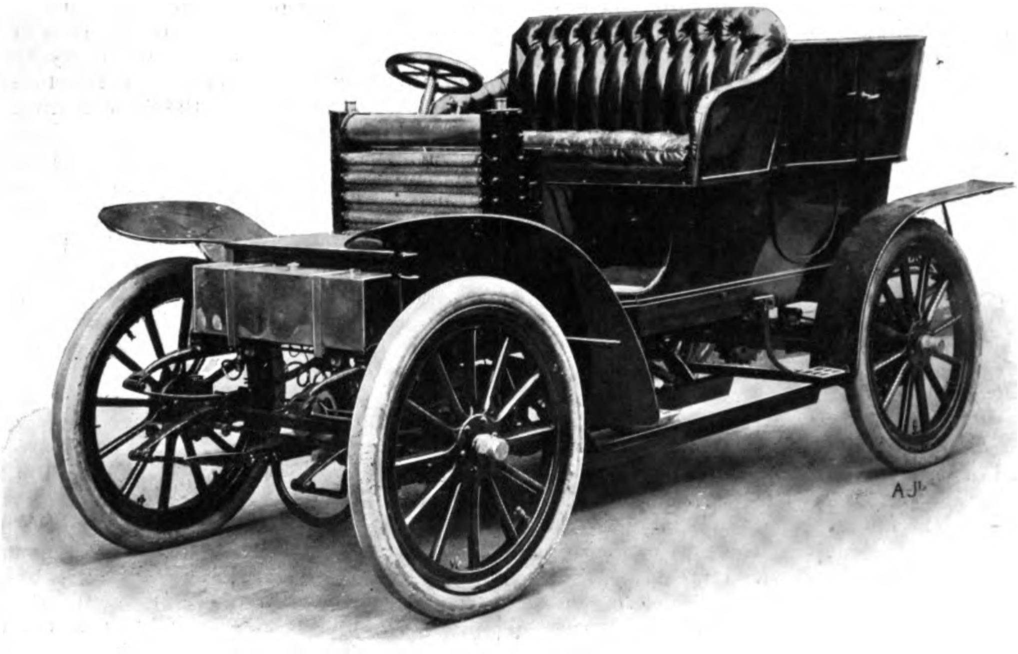
of the Century cars is that an electric light is fitted to the change-speed lever in such a manner that it is automatically switched on when changing from one gear to another at night, the light being thrown down upon the notched quadrant. The Humber Company's latest 20-h.p. chassis, which we illustrated last week, formed the central attraction of their stall. A completed vehicle of the same size was also shown, and two standard 12-h.p. tonneaus, together with an 8-h.p. delivery van.

The Hozier Engineering Company had two 10-h.p. twin-cylinder Argyll tonneaus, and another complete car with a single-cylinder 9-h.p. engine. Their direct-through-drive "Govan" change gear, and the other interesting details of their cars, were open to minute inspection on the 10-h.p. chassis on the stall.

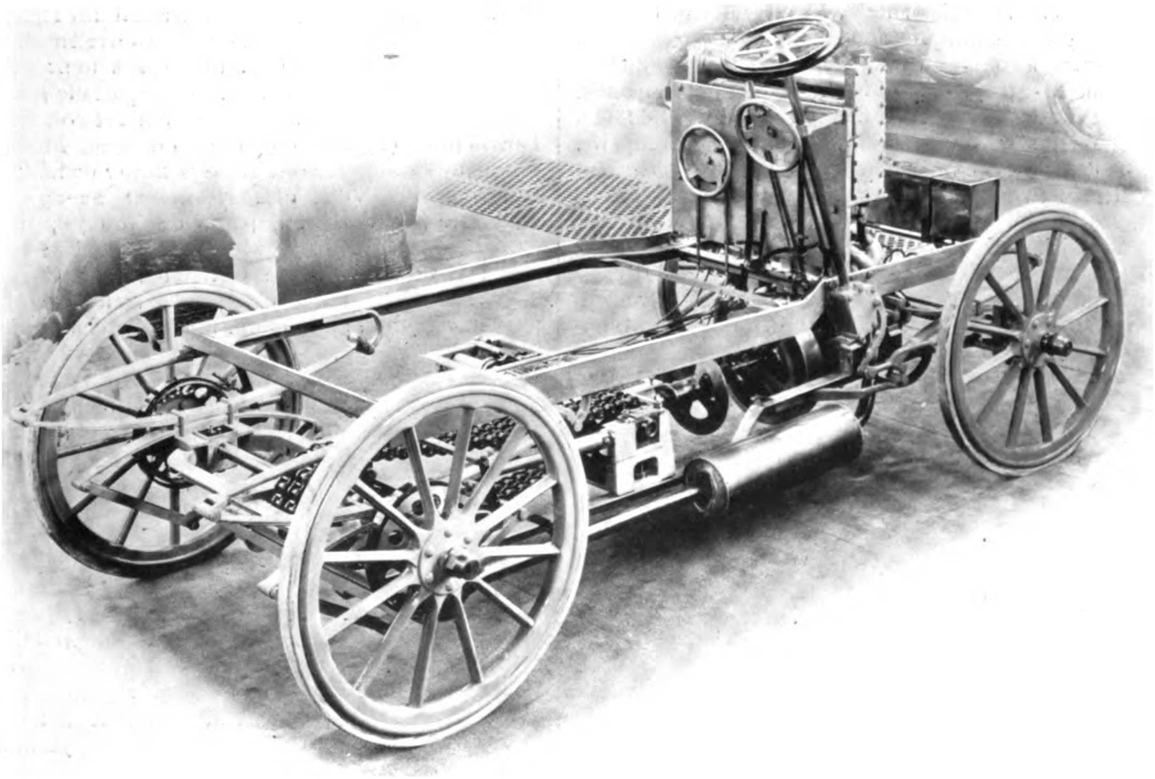
A considerable number of firms displayed their essentially British models in which distinctive systems have been developed, and in which but little or no attempt has been made to copy other makes. Many of these vehicles are already well-known to our readers, and others of them will be dealt with by us at greater length shortly. It is interesting, however, to notice that no less than six makers employ horizontal engines—the Wolseley Company, Wilson and Pilcher, James and Browne, the Lanchester Company, the Albion Company on their 10-h.p. model, and the Pick Motor Company. Five makers use triple cylinder engines, without taking into account the American Duryea model. These are the Wolseley Company, on their 45-h.p. racer, J. W. Brooke and Company, the Maudslay Motor Company, Marshall and Company, on their 20-h.p. vehicle, and one of the new makers—Weller Brothers, Limited. The last-mentioned Company, when employing three cylinders, do not arrange the cranks at 120 degrees from one another, but place the central one opposite to those on either side of it, and increase the weight of the central piston and connecting rod. The new petrol cars manufactured by the Thornycroft Steam Waggon Company naturally attract a large number of visitors and motorists generally. We hope to give a full description of them in our next issue. The 10 and 20 h.p. types are similar in arrangement except that the one has a two-cylinder motor, and the engine of the other has four cylinders. The main frame is of special steel construction, stiffened with angle plates at the corners. The engine and the gear box are carried on a separate underframe, and the power is transmitted by a longitudinal shaft to a live-rear-axle. The crank chamber is so arranged that the base can be taken off without disturbing the main bearings. The induction pipes are mounted so as to swing up out of the way when released from the yoke-piece, which holds the atmospheric valves in place. All the moving parts of the engine, including the governor, are enclosed, the main clutch is of the expanding type, and the internal parts are balanced so as not to be affected by centrifugal force when revolving at high speed. The gear-box provides for a direct through drive on the top-speed, and none of the intermediate wheels on the lay-shaft, or the reversing pinion, revolve when not actually in use. The three speeds and a reverse are operated by a single lever. The couplings at each end of the propeller-shaft are of special and simple construction, and the entire shaft is enclosed in a leather casing from end to end. The brake-drums throughout have a V-section, and the bands which operate against them are double-acting. The clutch pedal is on the right, and the brake pedal on the left, of the steering-pillar. They are arranged so as to be pressed forwards, instead of down



The 20-h.p. Thornycroft Petrol Chassis.



The Langdon-Davies Petrol Car.



Langdon-Davies Petrol Chassis.

wards, by the driver's foot. The accompanying illustration gives a general view of the 4-cylinder chassis.

Many new features are to be seen on the Weller petrol cars, one of the most important being that the engine, change-speed gear, and the countershaft are mounted rigidly together upon a separate frame, which is attached to the wooden main frame at three points only. The engine itself is built up with as many cylinders as required, each cylinder being cast separately, and each of the cranks being enclosed in a separate crank-chamber, so constructed that the desired number can be bolted together by three steel rods with an intermediate bearing for the crank shaft between each. The ends of the built-up crank-chamber are circular, and provide long outside bearings for the crank-shaft. The inlet valves are arranged above the exhaust valves, and are normally *opened* by helical springs, which are stronger than the ordinary springs holding the valves on their seats. The cams allow the valves to close instead of opening them in the usual way, and the power of the engine is varied by regulating the extent to which they open. The main clutch is so constructed as to also form the reversing gear, and there are many other characteristics of these cars of which we must leave a description for a future occasion. The complete car shown has a 4-cylinder motor, and is apparently extremely strong, and if anything somewhat over heavy.

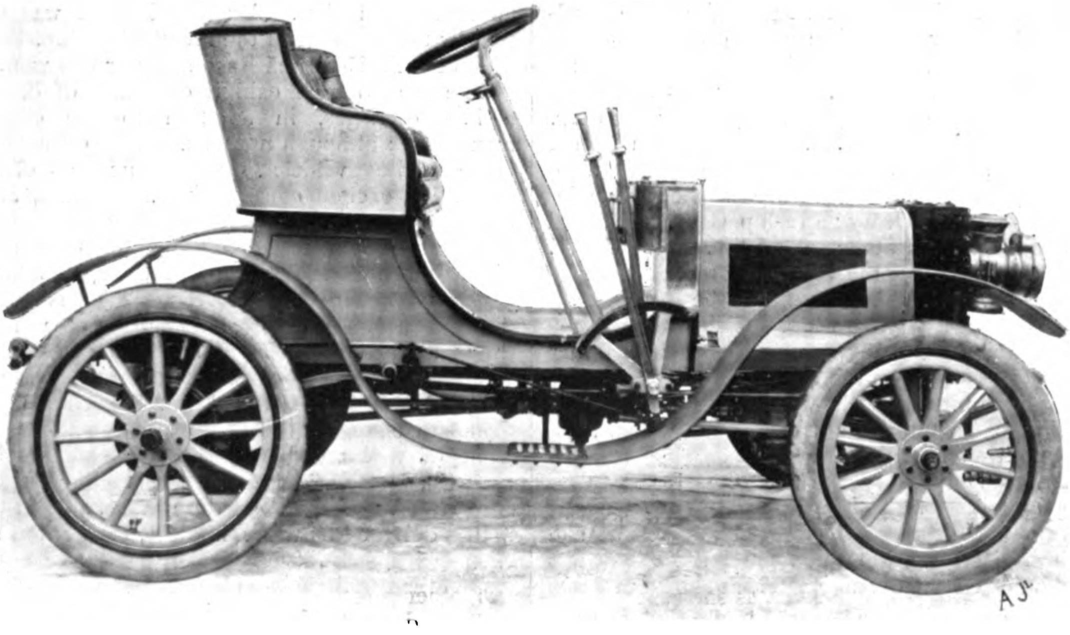
The Langdon-Davies Motor Company's "Soames" car is made by this well-known firm of electric motor builders, and is of very novel construction throughout. The engine and transmission gear is carried upon an independent underframe, which is separately suspended by a system of leaf springs beneath the axles, the body being carried by the usual semi-elliptic springs above them. A full description will be given shortly. The Eagle Engineering and Motor Company also have a novel type of carriage, which is shown for the first time, in addition to their light tandems, which somewhat resemble, at first sight, the well-known Century tandems of the Century Engineering Company. We must defer our description of the Eagle cars, and also of the new models shown by the Pick Motor Company.

The Maudslay Motor Company have introduced several very ingenious improvements on their 1903 20-h.p. vehicle. The inlet and exhaust valves are arranged in the heads of the three cylinders, and are mechanically operated from a cam-shaft, which passes across above the cylinders. The cams are enclosed in a casing, which is hinged to the cylinder casting, and can be swung over out of the way when it is necessary to remove either of the valves. For this purpose the vertical shaft which connects the crank-shaft with the cam-shaft has a universal joint in line with the hinges above referred to, so that it is unnecessary to disconnect any of these parts when removing a valve. The commutator is mounted on the dash, and is driven by the forward end of the cam-shaft, which comes into engagement with its spindle whenever the cam-shaft is in its normal position. Other features of this well-built car will be referred to later. J. W. Brooke and Co. showed three of their well-known 12-h.p. cars and a new 15-h.p. 3-cylinder motor which they are introducing for their new light car. All three cylinders are cast together, and they are fitted with mechanically-operated inlet valves on the same side as the exhaust valves. The inspection plugs above all six valves are held in place by set screws passing through a yoke-bar, which is hinged to the cylinder casting at each end. The cylinders have a bore of $3\frac{5}{8}$ inches, and the stroke is $4\frac{3}{4}$ inches. The Company have introduced a new automatic governor in which the suction in the induction pipes is utilised for closing the throttle valve. This has been adopted instead of the nearly equally simple exhaust-gas-controlled governor previously used by them. As in the former case, this governor dispenses with any mechanically operated parts, and is in no way connected with any revolving parts of the engine. We have been compelled to hold over our illustrations of the engine and of the governor.

James and Browne show a standard 9-h.p. chassis, together with a tonneau and a landaulette of the same size. Their most novel exhibit, however, is a new 18-h.p. six-seated tonneau, which has a 4-cylinder engine instead of one with two cylinders. The new arrangement of the mechanism is practically the same as before, except that a pair of horizontal cylinders are mounted on either side of the central fly-wheel. Extremely long bearing surfaces are provided on the crank-shaft; each crank runs in a separate compartment, and there is an intermediate bearing between each pair. In both models many ingenious improvements have been made. The main clutch has metal-to-metal friction surfaces, and is normally held in engagement by four springs. The brake on the countershaft has two metal shoes, which are forced together against the drum by a powerful cam action. The rear brakes are of the same special pattern as before, except that the operating lever now turns the other way. The induction-pipes are hinged so as to swing out of the way to get at the valves. They are held down in place by a swinging yoke-piece with a single tightening screw in it, and the valves are certainly as readily accessible as on any engine we have seen. The makers' special system has proved itself so satisfactory in the past that with this year's improvements the James and Browne cars ought to be specially good.

Other all-English vehicles which are on view are the Lanchester (shown on the London Motor Garage Company's stall), Messrs. Alldays and Onions' "Traveller" voiturette (*see* Vol. VII, November 22–29), the Swift voiturette (*see* Vol. VII., pages 645 to 648), the Progress Company's light cars, Messrs. Marston's Mabley car, and the vehicles of the General Motor Car Company. The Star Engineering Company's stall is equipped with their latest 7-h.p. and 10-h.p. models, a chassis and a complete tonneau of each of which are on view.

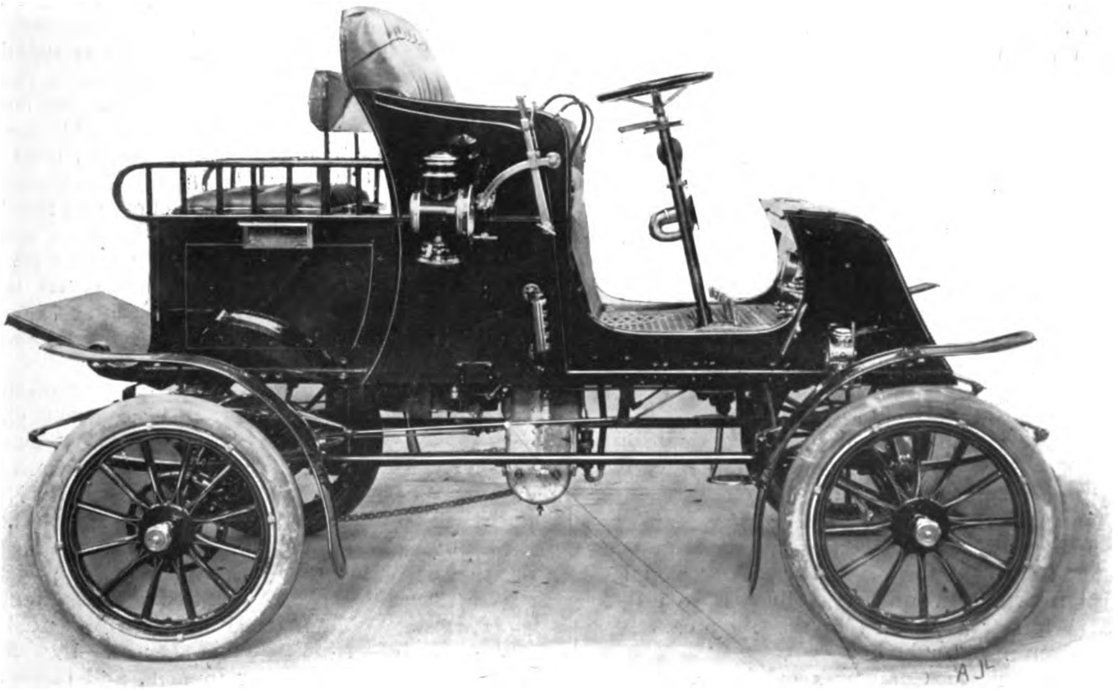
The Beaufort Motor Company have introduced many important improvements in their vehicles, and exhibit vehicles ranging in size from 8-h.p. up to 20-h.p. A special popular type is fitted with a single-cylinder vertical engine having mechanical inlet-valves which work in an oil bath, and an automatic governor which also works in oil. The ignition is of the Company's special magneto type, and the circulating pump is driven by enclosed gearing. This two-seated car is of the live axle pattern, the power being transmitted from the gear-box by a Cardan shaft. A 10-h.p. model is of similar construction, and has a twin-cylinder motor. The 20-h.p. vehicle has mechanical valves, all the moving parts of the engine run in oil baths, ball bearings are fitted throughout, the power is transmitted to the rear wheels by side chains, and a honeycomb cooler is provided. In all these models ball bearings are employed, a direct-through drive is obtained on the top speed, and in the 20-h.p. type provision is made for starting the engine from the seat, by the ignition apparatus.



The Eagle Petrol Voiturette.

The Siddeley Autocar Company, of Coventry, made a very comprehensive show with the well built Siddeley cars sold by them. A chassis of each of the three types, 8 to 12-h.p., 12 to 16-h.p., and 18 to 24-h.p., were on view, as also a complete vehicle of the first mentioned type, and a "Baby" Siddeley. These vehicles are fitted with all the latest improvements, including mechanical-inlet-valves, magneto ignition, and honeycomb radiators.

Many interesting chassis of the latest Continental models were shown by the English agents for these cars; several of which have previously been described by us in connection with the Paris Exhibition, and that at Earl's Court. Amongst



The New 10-h.p. Locomobile Steam Car fitted with Wheel Steering and Wooden Wheels.

such may be mentioned the 20-h.p. Panhard, on the handsome Panhard-Levassor stall; the 12-h.p. Bardon of the Auto Carriage Company, which we illustrated last week; a Gladiator chassis by S. F. Edge, Limited; De Dion new models; a 16-h.p De Dietrich by Mr. C. Jarrott; a 20-h.p. and a 12-h.p. Darracq shown by H. E. Hall and Co.; a 15-h.p. Charron, Girardot, and Voigt, shown on the stall of Evart Hall, Limited; a 16-h.p. and 20-h.p. Rochet-Schneider shown by Capt. H. H. P. Deasy; a 12-h.p. Georges Richard on Mann and Overton's Stall; a 10-h.p. and 14-h.p. Chenard and Walcker in the Weston Motor Syndicate exhibit; a 20-h.p. F.I.A.T. shown by the Continental Automobile Company; a 10-h.p. Clément by the Farman Automobile Company, and a new twin-cylinder Benz, with vertical engine, on the Hewetsons' Stall.

The Panhard exhibit was well calculated to maintain the high reputation of that unique firm, and was placed in a very central position near the great organ. The vehicles had the latest Dunlop tyres, and the Krebs Carburettor was to be seen fitted in place. The company also showed an engine similarly equipped running in a small galvanised iron shed outside the main building; it was connected to an electrical dynamometer, as shown in Paris. This apparatus enables the horse-power of an engine to be taken very conveniently, and without any rubbing contact being necessary between the lever-arm and the flywheel on the motor shaft. The action of an ordinary armature on the field magnets forms an electrical brake, the strength of which can be varied by switching on and off incandescent lamps arranged on a board near by. The field magnets are mounted on bearings concentric with the shaft, and are, therefore, free to make a partial rotary movement. The lever-arm which carries the weights is fixed to the field magnets.

The Auto Carriage Company, Limited, not only showed the chassis above referred to, but had two complete vehicles of the tonneau pattern, and one fitted with a Limousine body, besides an apparatus for demonstrating the Bardon magneto ignition system. During the week we made a run on one of these new Bardon models out to the Crystal Palace, and were very favourably impressed with its capabilities, with its smoothness of running, and with the silence resulting from the balanced motor employed.

S. F. Edge, Limited, showed all the new Gladiator models, particulars of which have already been given, the Gladiator stand was one of the most complete in the Show, and special interest was taken in the latest 4-cylinder cars.

The Milnes-Daimler exhibit included various public service conveyances and several of the large vans with which this company are doing a large business. One of the latest 28 to 35-h.p. Mercedes-Simplex chassis, fitted with an unfinished body, to show the metal panelling employed, is also to be seen on the stall, and an 8 to 12-h.p. 4-cylinder car, with all latest improvements, including throttle-governor, was also shown, this having a similar body to that supplied to the Duke of Portland.

The De-Dion Bouton stall is very complete, and has enabled the Company to bring their many interesting new types of vehicle before the English public. The "Popular" voiturette in particular was inspected by a large proportion of the visitors. Particulars of the 1903 cars have already been given in our columns.

The Roadway Autocar Company's exhibit of Renault and Mors cars was very complete, these two excellent examples of Continental skill being amongst the best of modern automobiles. A special interest was added to the stall by the presence of the identical 20-h.p. Renault upon which the Paris-Vienna Race last year was won.

The De Dietrich exhibit consisted of 8, 12, 16, and 24-h.p. carriages, in addition to the chassis already mentioned; although not new, even to English motorists, these excellent vehicles, with their neatness of arrangement and finish, excited considerable admiration, and appeared to attract many purchasers.

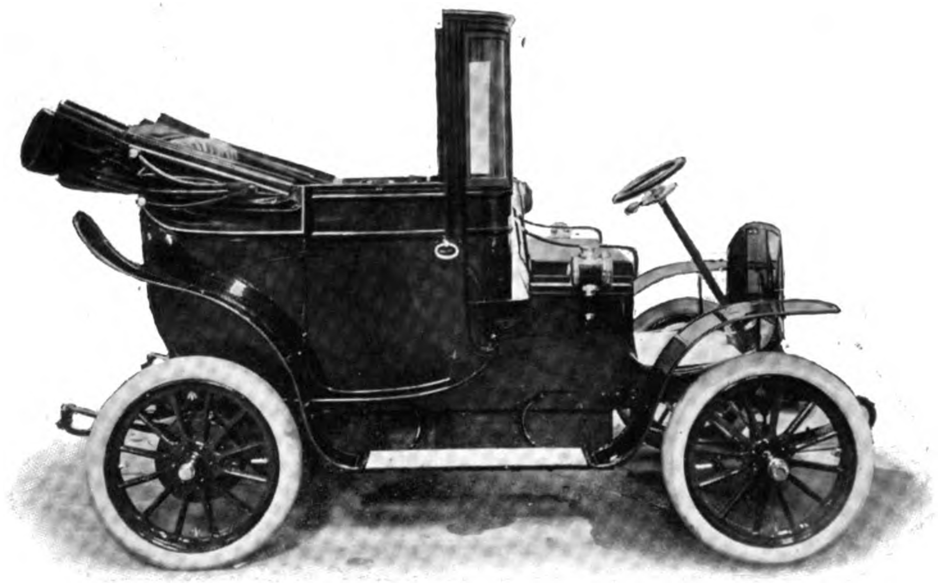
Messrs. Mann and Overton show a 20-h.p. Mercedes Simplex with Cannstatt tonneau body, in addition to their Georges Richard cars. A model was also provided demonstrating the Georges Richard system of ignition, and the method of advancing and retarding the spark.

The London Motor Garage Company again showed their "Pipe" and "Magnet" vehicles, and the Great Central Garage Company exhibited their Earl cars, together with an assortment of well-known Continental vehicles. C. S. Rolls and Co.'s stand was of particular interest as we have above said, and it included several Panhard vehicles with bodies designed by the exhibitors, in addition to the racing cars.

Of other well-known Continental vehicles the Graphic Motor and Engineering Company represented those of Déchamps, of which 7 and 9-h.p. twin-cylinder types, and 14 and 18-h.p. 4-cylinder types were on view. "Cottereau" tonneaus of 7 and 10-h.p., an omnibus of 10-h.p., and a waggonette of 16-h.p., as also a 16-h.p. engine, are to be seen on the stall of McNeill, Hutchison, and Borthwick. 10 and 20-h.p. Decauvilles, together with rough and finished parts indicating the quality of material and workmanship, were shown by the Motor Car Company. E. W. Hart has an exceptionally fine show of Mercedes cars, fresh from Cannstatt, the flying Darracq already referred to, and a large assortment of other noted foreign machines. Other Continental petrol cars are also shown, but we are reluctantly compelled to hold over any reference to them for the present.

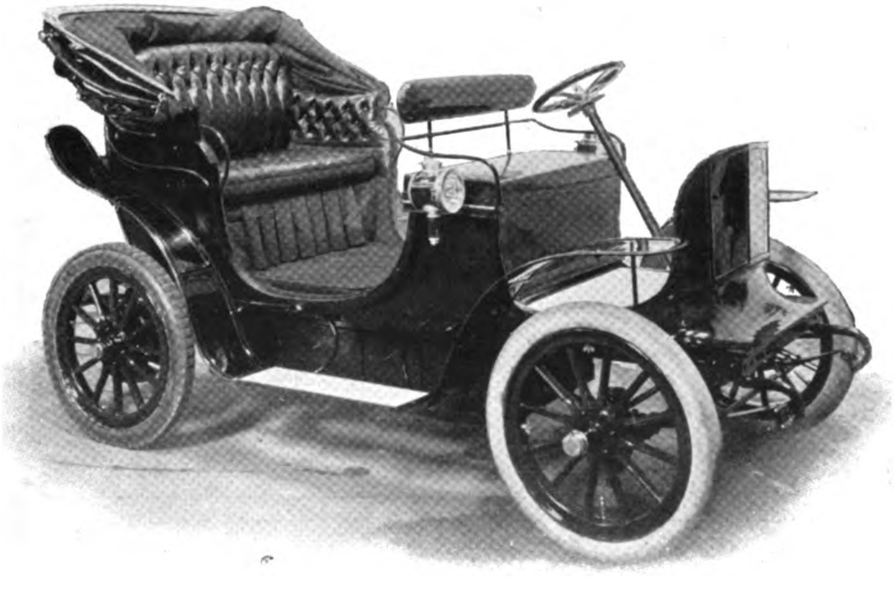
The principal exhibits at the tastefully arranged stall of the Electromobile Company (Limited), were one of the new Contal chassis built at Leeds, and a town landaulette, a new type of vehicle specially designed for London use, of a more comfortable and luxurious kind than the familiar electric brougham now in use. The landaulette has low driving seats instead of the high box, and the steering is of the inclined pillar and wheel type. The low driving seats in front enable a much better view to be obtained from inside the carriage than where the driver is perched up on a box, and also have the advantage of rendering the vehicle suitable for being driven by its owner when desired.

The chassis, which is equipped throughout on the Contal system, is standardised for all the Electromobile Company's electric vehicles, these now differing from one another only in the bodies attached. The Contal motor and batteries were described in THE AUTOMOTOR JOURNAL for November, 1901, and the general features of the system as exemplified in the new chassis remain the same. This, however, with the exception of the front axle, is now completely British built from start to finish, and a very attractive piece of work it is. The frame itself is of channel steel with two cross struts of similar material near the front and the rear. It is rectangular in plan, and though light is strongly built. A single series-wound Contal motor is mounted, with spring suspension about the rear axle,



The Electromobile Company's Landaulette.

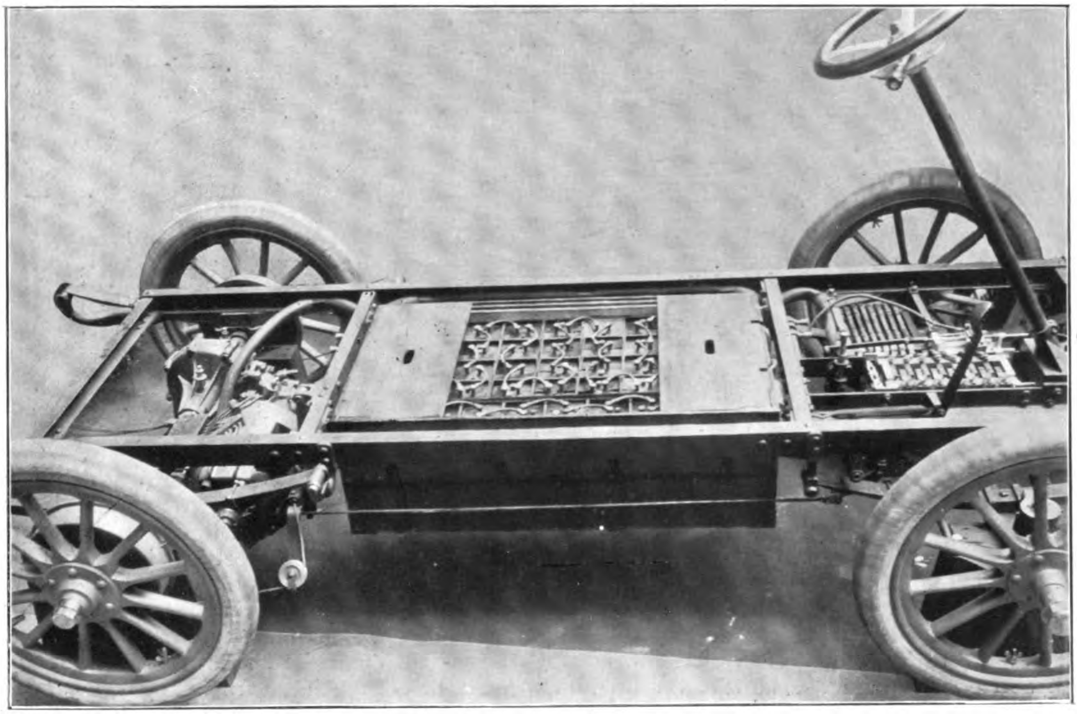
and drives through completely enclosed double-reduction gearing on to the differential of the live rear axle. The wheels are of the artillery type, and both the rear wheels are provided with very effective brakes controlled by a foot lever behind the dashboard. These are of the expanding type consisting of two pivoted blocks mounted inside a ring and expanded by means of a double toggle joint operating against the action of a powerful spiral spring. The controller is mounted horizontally in front of the chassis, and is operated by a hand-lever immediately under the steering wheel, which actuates it by means of a sleeve passing down the inclined steering pillar, and carrying a quadrant at its lower end, which engages with a spur wheel on the end of the controller. The various positions of the controller give five speeds and a reverse by different groupings of the motor fields, and arranging resistances in connection with them. Two positions of the controller also provide an electric braking effect, in the first of which the armature circuits are closed through a resistance, and in the second of which they are short-



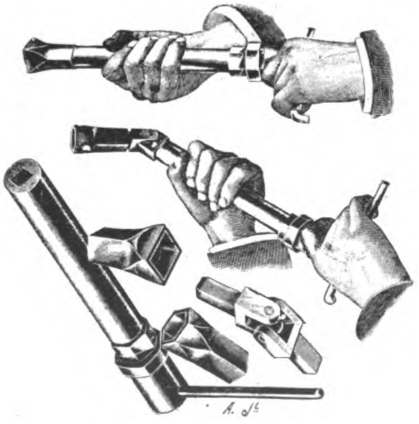
The Electromobile Company's Victoria.

circuited altogether—current in that case being separately provided for the fields. A neatly designed quick-break cut-out is operated by the brake pedal, so that the rear wheel mechanical-brakes cannot be put on without first throwing the motor out of action. The battery is slung exactly in the middle of the frame, and mounted underneath it so as to render the batteries readily interchangeable, a particularly neat arrangement being adopted for this purpose. The battery box is carried by four lugs, through which project four stout horizontal taper pins, when it is in position. When a battery is to be removed its weight is taken by a lift or jacks, the taper pins are screwed back by winches, and the battery box can be then lowered, the carriage wheeled away, and a fresh battery attached to it. The battery box itself contains an adjustment by which all the cells can be tightened up in position, and this, of course, can be relaxed for removing them for inspection. When the battery box is to be dismounted, connection between it and the car can be completely severed by a flexible connection and a concentric plug. This plug is removed for charging and another one inserted. This method completely obviates the possibility of the car being started while on charge, as sometimes may happen when a car is charged through the controller. The battery consists of 44 Contal cells of 135 nominal ampère hours, though said to give 150 ampère hours in practice. The batteries themselves are identical with the cells described in our issue for November, 1901, page 61. The Electromobile Company also exhibit the new Contal "Auto-Cle," of which we give an illustration. It consists of a shank with ratchet-head to which can be attached box spanners of the requisite sizes, a universal joint being added when the position of the nut to be unscrewed does not allow of easy access.

The Baker Electric Runabouts are exhibited at the Anglo-American Motor Car Company's stall. We gave an illustration of one of these vehicles in advance in our last issue. In this vehicle the frame resembles that of many American steam cars. A four-pole compound wound motor is mounted amidships, and drives by double reduction on to an open differential on the rear live axle. The motor drives a short countershaft by spur gearing, and this countershaft carries a sprocket wheel from which the transmission to the differential is by a single chain. The controller is mounted under the seat on the right-hand side, and is operated by a side lever. Two brakes are fitted, one on the motor shaft and one on



The Electromobile Company's Standard Chassis.



The Contal "Auto-Cle."

the differential; the steering is of the tiller type. The different speeds are obtained by introducing resistances into the field windings. The battery consists of twelve 70 ampère-hour Exide cells, these being mounted under the seat. The connections between the cells are permanent, all being in series. The Anglo-American Motor Car Company are the English agents for these cars, and also for the Vehicle Equipment Company, one of whose interesting broughams was also on their stand. The principal feature of these vehicles is that vertical and downwardly projecting guides are fixed to the main frame at each side, so that the front and rear axles are free to slide in them against the action of compression springs. The axles are provided with square boxes which fit in the guides, the arrangement resembling the railway practice of employing horn-plates. In the Brougham shown, double-elliptic side-springs are employed at the rear between the frame and the axle, outside the guides; two semi-elliptic transverse springs forming an ⋈ serve the same purpose in front, the ends of the upper spring being secured to pins passing across the guides, and the ends of the lower spring being articulated to the boxes on the axle. Two separate motors are mounted about a stationary rear axle, and drive by raw hide pinions on to spur wheels attached to the spokes of the driving wheels. The driver's seat is perched up behind as in a hansom, and he steers with a tiller. The controller is situated under the seat, and gives four forward speeds and two reverse speeds. An important feature is the arrangement of the battery, which is slung under the centre of the frame in a special cradle, so that the battery can be slid out at either side. This Company, we understand, do a very large business with heavy vehicles in the States, and the Anglo-American Motor Car Company are making arrangements to put these lurries and wagons on the English market.

The City and Suburban Company have, as usual, a very fine exhibit of electric broughams, and on this occasion there are also two large 'buses and several small runabouts, together with a striking white phaeton having a single seat in front, with hood and a second seat behind. One of the most attractive exhibits at this stall is the Queen's elegant Victoria, which we illustrate. The Company also display the combined petrol-electric car, which we referred to last week, and which we illustrate and fully describe elsewhere in the present number.

We are compelled to hold over any detailed descriptions of the numerous interesting steam vehicles which are shown, and are also unable to deal with the very excellent tyre exhibits made by all the well-known leading makers—the fact that the Dunlop Company have won the first prize and the Collier Company the second, in the important Tyre Trials of last year, has given their stalls an especial interest.

(*To be continued.*)

A word of praise may be bestowed on the general arrangement of the Exhibition catalogue. This was singularly well and effectively carried out, and was illustrated by a particularly clear plan of the whole Exhibition. We have had occasion to complain in the case of some previous exhibitions of lack of lucidity and comprehensibility in the catalogues supplied, and we are, therefore, the more anxious to recognise that the Crystal Palace catalogue is, in the main, not open to strictures of the kind. There is one improvement, however, which would be very useful to the public and would seem quite feasible. There is plenty of room on the plan, and the names of the exhibitors of the leading stalls might quite well have been printed on them, in addition to the numbers.

Mr. J. W. Lovegrove, of Piccadilly, who has made his name so familiar in the automobile world through the energetic and enterprising manner in which he has taken up the very important question of motor clothing in this country, had some very strong remarks to make, anent the apathy of the English clothing trade, at the fortieth annual dinner of the West End Foreman Tailors' Society, held last Saturday at the Hotel Cecil. He said that the West End firms nearly all refused to recognise that making motor clothing was a branch of the trade. "Oh, no," was a common remark, "we are not here to make up leather garments." French, and more especially German, firms had not been slow to seize such a neglected opportunity, and had now nearly the whole of the trade in motor garments in their own hands. The few English firms engaged in this department were nearly all tarpaulin manufacturers. These Continental makers had a great advantage over the English firms, as they were not controlled by trades unions, and so did not have a fixed standard of wages. If they were once allowed to secure the whole trade, with this important point in their favour, it would be difficult for the Britisher to offer any competition at all. Mr. Lovegrove's warning should be heeded by the British tailoring trade before too much way has been lost, or like the other branches of automobilism it will be found very difficult to regain the position once it is lost.

The Liverpool Cycle and Automobile Show was opened at St. George's Hall on Tuesday last, and promises to be as successful as previous exhibitions. Sir Alfred Jones, speaking at the inaugural lunch, pointed out the great importance of developing motors for commercial purposes for a city like Liverpool. He was prepared to give practical encouragement to improvements, and he therefore offered a 100-guinea cup for the best improvements in motor vehicles for commercial purposes, and a 20-guinea cup for the best pleasure motor car made locally. The Lord Mayor, Sir William Forwood, acted as chairman at the opening ceremony, and made a sympathetic speech. He was followed by Professor Hele-Shaw, who declared the Exhibition open, and in a suggestive speech of considerable length commented on the wonderful progress which had been made by the automobile in the last four years. If the best vehicles of to-day could have been described to engineers and constructors four years ago they would have been looked upon by them as realisations of the impossible. Among the principal exhibitors were the Road Carrying Company, who, amongst other cars, exhibited two Daimlers identical with those supplied to the King and the Prince of Wales. They also showed the Parsons Anti-skidder attached to the wheels. Darracqs and Rochets were in evidence at Mr. William Lea's stall, and the Rudge-Whitworth Company had an extensive display of their well-known cycles, though they have not hitherto entered the motor car or motor cycle industry. Other leading stands included an effective display by the Humber Company, and interesting exhibits by Messrs. Robinson and Price, Bennett and Carlisle, Star Cycle Company, Alldays and Onions, Limited, the Northern District Motor Car and Wagon Syndicate.

THE CHENARD AND WALCKER 10-h.p. PETROL CAR.—PART II.

THE engine is of the twin-cylinder type, and the crank-chamber, which is made of aluminium, has four feet cast upon it which rest upon, and are bolted to, the underframe. The engine is shown separately in Fig. 5, and in position in Fig. 6. The two cylinders are cast in one piece with their jackets, and the top of the jacket immediately above the cylinders is formed by a metal cover plate, which is held down by two nuts, and receives one of the water pipes. The valve chambers are formed on each side of the cylinders, those on the right receiving the inlet valves, and those on the left the exhaust valves. The usual inspection covers are fitted above each valve, those on each side of the cylinders being held down by yokes, M^1 and M^2, by a single bolt. The induction pipe, K, from the carburettor, K^1, terminates in a branch fitting which is secured to the cylinder-casting by a yoke, M^3, with one nut. The exhaust-pipe-fitting on the opposite side is held in place in a similar manner. The inlet and exhaust valves are interchangeable and are normally held on their seats by strong springs. The two cam-shafts lie inside the crank chamber on either side, and they are both driven by spur wheels through an intermediate wheel from a half sized gear wheel on the crank-shaft. The central part of the crank chamber is made in one piece, and is fitted with flat end castings which carry the crank-shaft bearings. The gear wheels driving the cam-shafts are enclosed in a separate casing as seen in the illustrations, the same casing covering the centrifugal governor mounted upon the crank-shaft. The exhaust cam-shaft is fitted with exhaust cams which operate the valves in the ordinary way, and its front projecting end is fitted with the commutator. The cam which makes and breaks the electrical circuit between the battery and the induction coil has two projections upon it instead of one—as is usual with a 2-cylinder motor—and there is only one contact spring instead of two. The same contact is therefore made twice during each revolution of the cam-shaft. The inlet cam-shaft carries specially constructed cams for operating the push-rods acting upon the inlet valve spindles; the shaft is provided with a long key-way so that it, together with the cams, can be moved longitudinally, although it is at all times driven by the spur wheel keyed to it. The shaft is provided with a collar at its forward end, which is engaged by the forked end of a lever, J^1. The other end of the lever is fixed to a spindle which is carried in bearings in the casing surrounding the governor, and the sliding sleeve of the governor engages with a second fork lever which is fixed to the same spindle. The governor is not provided with any spring, but when rotated it tends to force the inlet valve, J, rearwards, and to therefore slide the inlet cams, so that a different portion of their surfaces operates the inlet valves.

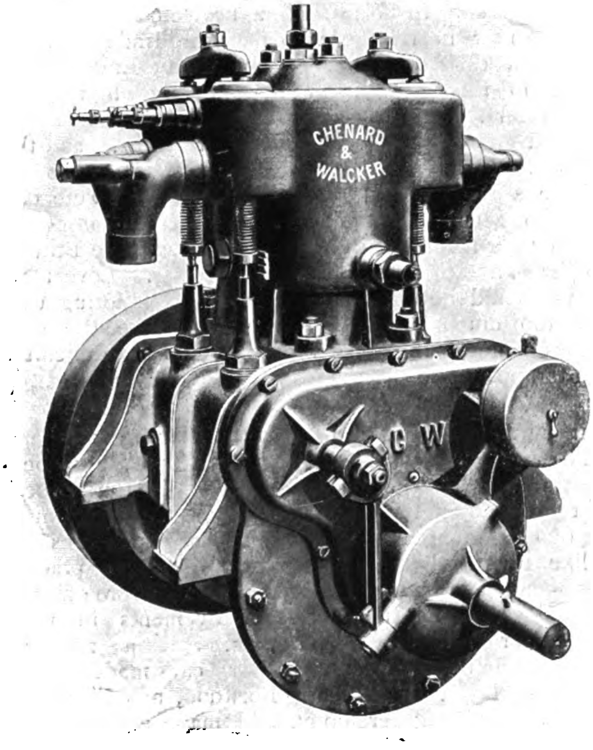


FIG. 5.—The Chenard and Walcker Engine.

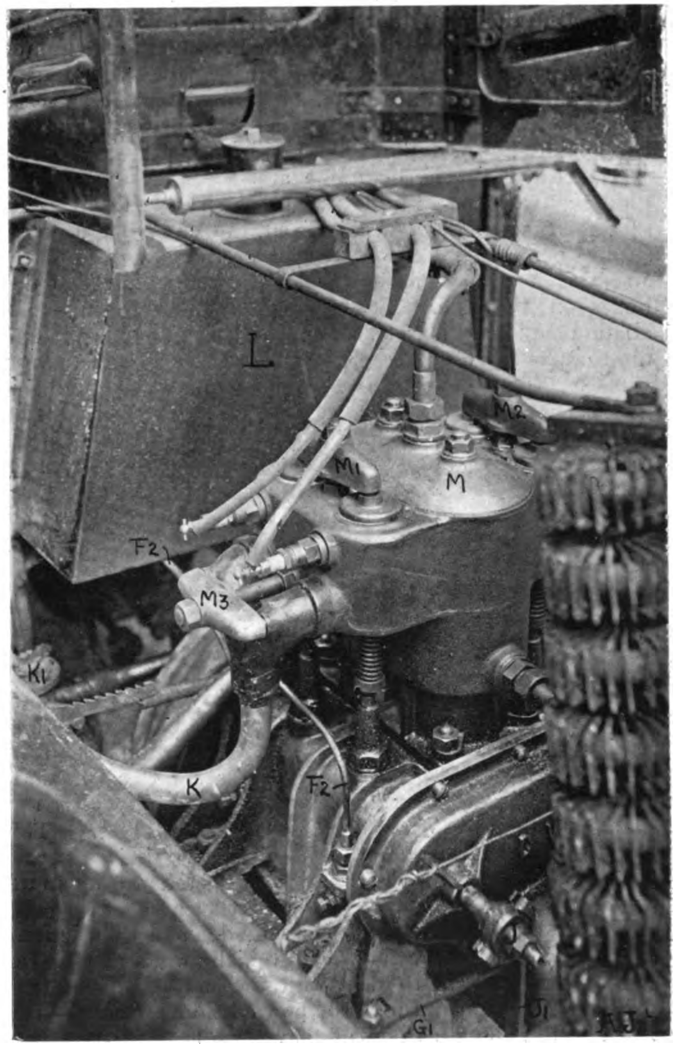


FIG. 6.—View of Engine in place, beneath bonnet.

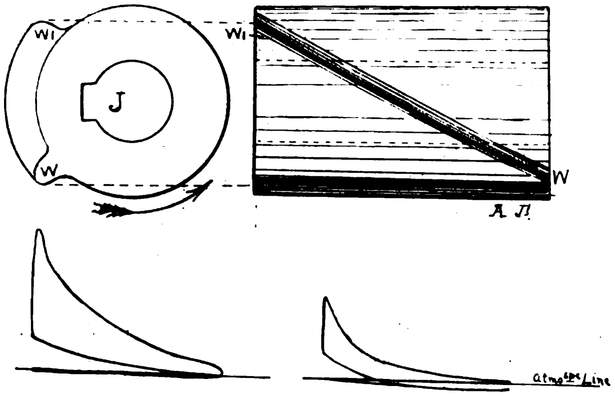


Fig. 7.—End and side elevations of Inlet Cam; also diagrams representing maximum and minimum loads.

The shape of these cams is shown diagrammatically in Fig. 7; the one view represents the cam in end elevation, and the other in side elevation. Referring to these drawings, it will be noticed that the cam-projection at the one end, W, would open the inlet valve at the beginning of the suction stroke, but that it would almost immediately afterwards allow the valve to close. The other end of the cam, W^1, however, would open the valve at precisely the same point and to the same extent, but it would hold it open until the completion of the intake stroke of the engine. At intermediate positions the valve would close sooner or later, according to the longitudinal position of the camshaft beneath the inlet valves. When the engine is first started, and if the controlling spring were adjusted for running at high speed, the left end, W^1, of the cam would be operating the inlet valves, and when the speed of the engine increased so the tendency of the governor would be to slide the cam along, reducing the quantity of mixture drawn into the cylinder and consequently reducing the force of each explosion. In practice, however, the controlling spring is not allowed to exert any pull when starting the engine, and consequently the cam-shaft is caused to slide longitudinally owing to the action of the push-rod on the tapered face of the cam, so that the right-hand end, W, is brought beneath the valve spindle, and a small quantity of mixture is admitted during each suction stroke. It should be pointed out that the extent to which the valve is opened is constant, and that, therefore, there is no throttle action on the carburettor, except such as is due to high piston-speed. The *quantity* of air drawn through the carburettor during the suction stroke of the engine varies in the aggregate, according to the position of the cams, but the *rate* at which it passes through it during any particular part of the stroke is not affected by changes of position of the cam-shaft. For this reason, the richness of the mixture is not affected by the action of the governor to anything like the same degree that it is when a throttle valve is employed. The effect of this method of regulation is clearly demonstrated by the imaginary diagrams, which are also represented in Fig. 8; that on the left is what might be expected to be given by a full admission during the whole inlet stroke, and that on the right shows a partial admission only. In the former case the diagram is the same as that for most petrol engines working at full load, but in the second diagram it will be seen that a vacuum is formed in the cylinder during the working stroke, that the compression is considerably reduced at the end of the next stroke, that the initial pressure resulting from combustion is considerably less, and that during the firing stroke the gases expand down to atmospheric pressure before the exhaust valve opens. Another interesting characteristic which should be pointed out in connection with this device is that the quantity of mixture admitted to the cylinder is varied but slightly by changes of engine speed, whereas when a throttle valve is employed the effect of the throttle becomes less and less as the engine runs slower. We are not sure that this is altogether an advantageous feature of the new arrangement, for it is often convenient if the force of the explosions becomes greater as the engine speed is decreased owing to increased load. It is, however, a small matter in any case, and we think that the advantages obtained, so far as the carburettor is concerned, entirely outweigh it. Were it not for the fact that the velocity of the air passing through the carburettor varies as the speed of the engine varies, the Chenard and Walcker governing system, in conjunction with an ordinary float-feed carburettor, would give almost identically the same result, so far as constancy of mixture is concerned, as are arrived at with the Krebs carburettor, described by us recently.

It has already been pointed out that the governor is not provided with a spring, and it will therefore be seen that the cam-shaft, J, with its cams, will be pushed inward by it so soon as the crank-shaft revolves. A second lever, G^1, is mounted so that it presses against the rear side of the lever, J^1. This lever, G^1, is connected with a hand lever, G, mounted on the dash in front of the driver, and provided with a toothed quadrant for holding it in any position. A spring is inserted between the lever, G, and the wire passing from it to the lever, G^1, and it is this spring which really forms the governor spring; as its tension is increased so the tendency of the governor to displace the cam-shaft is resisted, and so, therefore, the normal speed of the engine is raised. This is the only engine-regulating lever which is fitted to these cars.

The ignition plugs are screwed into the walls of the inlet valve chambers horizontally, and the insulated wires from each high-tension terminal of the coil are brought to them. The primary current passes through the coil twice during each revolution of the cam-shaft; the one contact being necessary to produce ignition is in the one cylinder and the other in the other cylinder; on both occasions, however, the current finds its way across from one high-tension wire to the other across the spark points of both plugs, the current passing from one plug to the other through the cylinder casting. The object of this arrangement has already been pointed out, greater synchronism between the two cylinders being obtained. The time of ignition is fixed, and the spark occurs slightly before the end of the compression stroke. The reason why back firing is not experienced when starting the motor has already been explained; the lead given to the ignition is slight, and the inlet cams are not admitting a full charge of mixture at that time. We can speak from experience as to the very easy starting of the motor. It is not difficult to see why the makers have decided to fix the commutator, instead of allowing the driver to vary the moment at which the spark occurs in the cylinders. Apart from additional complication so far as manipulating the vehicle is concerned, it will be realised that the method employed for governing the engine would be affected if the moment of ignition were to be varied. On a light load the moment of ignition could be advanced without causing pre-ignition, owing to the reduced compression in the cylinder and because the mixture fires less rapidly at lower compressions. If, therefore, an inexperienced driver were to advance the ignition whilst the engine was running on a light load, there would be a risk that serious pre-ignition would take place as the load on the engine increased, and as the governor allowed more mixture to be taken into the cylinders. It will have been noticed that in several modern vehicles the time of ignition has been rendered invariable by the manufactures, and we know of several other instances in which its use is intended to be occasional only, although provision may be made for such a regulation. It is only a skilled driver who can use the timing gear to full advantage on most modern vehicles, and the difference between using it and leaving it alone is not sufficiently great to justify its employment in the hands of the general motoring public.

The carburettor employed is of the Longuemare float-feed type, and its mixing chamber is exhaust gas jacketed. It draws its supply of air from the neighbourhood of the exhaust pipe, and it is fixed on the right side of the car almost beneath the dash. Half compression-cocks are fitted into the exhaust valve chambers, in corresponding positions to those occupied by the ignition plugs in the inlet valve chambers. A single exhaust pipe is led back, as shown in Figs. 3 and 4, to the exhaust-box behind. This box is a plain cylindrical drum, and has no baffles or obstructions inside it of any kind. The gases are led in the one end, and are allowed to escape through a few perforated holes at the other. Considering its construction, the exhaust is remarkably silent—and, in fact, when the engine is running light no sound can be heard. This, of course, as already pointed out, is due to the reduced volume of explosive charge, and to the complete expansion in the cylinder during the working strokes.

The engine develops about 12½ brake h.p. when running at 900 revolutions per minute. It is intended to run at any speed up to 1,200 revolutions per minute, and we have ourselves seen it continue to work at a speed of considerably less than 100 revolutions per minute.

The combined main clutch and foot brake is shown sectionally in Fig. 8, where N is the flywheel fixed to the crank-shaft. The flywheel is provided with projecting jaws, N^1, by means of which the power is flexibly transmitted to the outer member, N^2, of the cone-clutch, that member having corresponding slots into which the projections, N^1, fit. The portion, N^2, is mounted freely upon the end of the shaft, R, the other end of which is connected by the coupling, R^2, with the change-speed-shaft, S. The inner and sliding portion, P, of the clutch has two cone faces, the one of which engages with the clutch member, N^2, and the other with a fixed brake-ring, Q. The member, P, rides upon a square portion of the shaft, R, and is normally held in its forward position by the helical spring, R^1, about the shaft. The foot-pedal, C, which is pivoted at C^1 operates the clutch through a second lever, C^3, and an adjustable stud, C^2. The lever, C^3, is pivoted on a rod, C^4, and its lower end is forked to engage with the pins on the thrust collar, P^1. The inner clutch member, P, does not come into contact with the brake-ring, Q, until after it has been withdrawn from the clutch member, N^2. The foot-pedal, C, is so arranged that it can only disengage the clutch, and cannot apply the brake. A second lever, D, which is seen in Fig. 3, is, however, connected with the clutch, and in such a way as to give a further *travel* to the cone portion, P. The ring, Q, is made of cast steel, and is bolted to the longitudinal members of the underframe. The foot-pedal, D, affords the driver a very powerful brake, and can only come into operation after the clutch has been withdrawn. By this arrangement a very powerful and simple brake is provided. As we recently pointed out, this brake is open to the criticism that it imposes a strain upon the change-speed-gear, as well as upon those portions of the transmission mechanism affected by the usual countershaft brake, and it may be added that it would be ineffective if by chance the change-speed-gear were allowed to be in a neutral position. We are inclined to think, however, that these considerations are not of serious importance, and that the other advantages obtained compensate for them. It will be noticed that the construction provides a flexible connection between the fly-wheel and the gear-box, preventing any strain from being imposed upon the shaft. The rear end of the engine shaft terminates in a spigot, which takes a bearing inside the forward end of the intermediate shaft, R.

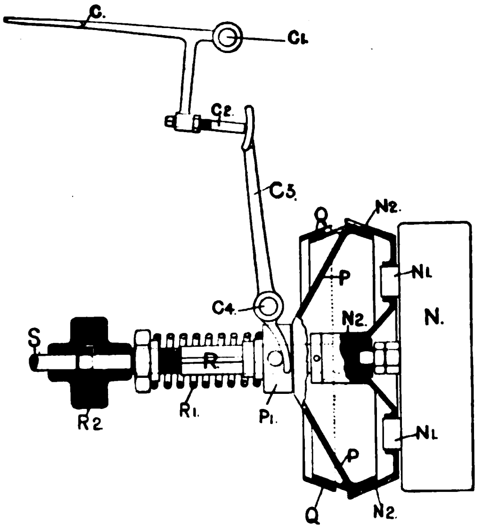


Fig. 8.—Diagrammatic drawing of combined Clutch and Brake.

The gear-box, A, Fig. 3, is rigid with tubes, A^1, which enclose the countershaft, and which pass through the brackets, fixing it to the frame up to the sprockets from which the side chains take the power to the rear-wheels. These tubes enter split sleeves, which are formed in one piece with the two portions of the gear-box enclosing the differential. When in place they are held tightly by bolts passing through the upper and lower split portion. The gear-box is carried at its rear entirely by these tubes, and at its forward end it is fixed centrally to a cross-member of the main frame, a third point of suspension being thus obtained for it. By this construction any twisting of the frame, owing to inequalities of road surface, is unable to produce additional friction on any of the moving parts, for the box can only twist about its front point of suspension, and the flexible coupling between it and the engine allows for any such movements. The gear-box is made in six pieces, including the removable cover-plate on top. The main portion contains the change-speed-gears and is cylindrical, cover-plates registering with it are bolted in place at each end, and the two halves forming the casing, *a*, round the differential are bolted to the rear-cover-plate.

Three forward speeds and a reverse are provided, the top speed being a direct-through-drive from the clutch-shaft to the small bevel wheel driving the differential gear. The direct connection through the box is made by a jaw clutch, and the front portion of the shaft carries a spur wheel which is at all times in mesh with a corresponding wheel on a lay-shaft mounted above the other shaft. Two sliding wheels, only, are carried upon the squared portion of the direct-through-drive, and the "reverse" is provided by an intermediate pinion, which is in mesh with the rear wheel on the lay-shaft. The reverse speed is considerably lower than the first speed, and is brought into action when the gear-lever is in its *foremost* position. The lever is moved towards the driver for bringing higher speeds into play. The differential has bevel-planet wheels.

Lubrication of all parts is effected from a single lubricator, F, fixed to the dashboard. The oil contained in it is kept under pressure by a pipe leading from the exhaust pipe. It is provided with a gauge showing the level of the oil in it, and two pipes, F^2, pass from it to the crank chamber of the engine. Sight-feeds are provided for each cylinder, and the oil can only flow to them when the engine is running and there is a pressure in the exhaust pipe. The lubricator is also fitted with a hand pump which allows the driver to force oil through the pipe, F^1, to the gear-box. This oil feed suffices for the change-speed-gear, the differential, and the countershaft bearings.

The petrol tank, which contains 4½ gallons, is fixed beneath the front seat; the pipe leading from it to the carburettor is seen in Fig. 3, and is marked E. The water tank, L, is fixed immediately in front of the dash, and a centrifugal pump, which is driven by friction from the flywheel and is attached to the underframe, circulates the water from it through the radiator in front, and through the jackets. The arrangement for these parts is such that natural circulation will take place in the event of the pump failing to work. The ignition apparatus is contained in a box, H, fixed behind the dash. It contains two 4-volt accumulators, either of which can be employed at will. The induction coil is also placed in this box.

The regulating levers are conveniently arranged, and do not prevent the driver from mounting to his seat from the "off" side of the car. The side levers, A^2 and B^2, operate the change-speed-gear and the rear brakes respectively. The pedals, C and D, control the main clutch, and the latter also operates the clutch-brake. The speed of the engine is entirely regulated by the small handle, G, in front of the driver on the dash. The brake lever, A^2, is not connected with the main clutch, so that the side brakes can be applied without disengaging the clutch. We understand that the manufacturers intend to connect the foot-pedal, D, with the speed-lever, G, in future models, and to arrange the connection in such a manner that the speed of the engine is automatically reduced when the pedal is depressed. The arrangement will be such that the speed will again be increased to the same degree as soon as the pedal is liberated.

We have ourselves made a practical trial of this vehicle, and have driven it for some little distance, under usual working conditions and in traffic. We can, therefore, speak from personal experience as to its capabilities and many good features. We were very pleased with its performance. The small amount of manual effort required for starting the engine, together with its silence, are especially noticeable. When travelling, also, it is practically free from any vibration. We found the foot-brake both convenient and powerful, and were pleased to find that in ordinary traffic, on a level road, it is unnecessary to use either the second or first gears when restarting the car after having come to a complete standstill—although the third gear represents a speed of 27 miles per hour with the engine running at a reasonable speed. The car appears to be a good hill-climber, and the fact that the "reverse" gear gives a considerably lower speed than the first "forward" gear allows unusually steep hills to be mounted by travelling up them backwards, a fourth gear being thus practically available. The method employed for regulating the speed of the engine is very simple and effective. The result of moving the small hand-lever is immediately responded to by the engine, and a very constant speed is maintained by the governor when the lever is placed in any required position. It should, however, be pointed out to those driving these cars for the first time that this regulating lever should only be moved gradually from one position to another; if suddenly thrown a considerable distance from its "slow" position the effect is to increase the volume of the charge before the engine has been given time to increase its speed, and the result is that pre-ignition tends to occur.

If called upon to suggest any improvements in this useful car, we should find it difficult to do so, but we fancy that a stay between the steering pillar and the dash would be a slight improvement, and that the main clutch would be used less by the majority of drivers if the small lever regulating the engine-speed were brought up nearer to the driver's seat.

The standard bodies fitted to these chassis are of the tonneau type, and are of neat appearance. For rendering the mechanism readily accessible, the floor-boards both in front and in the tonneau are easily removable. A third seat is provided in the tonneau, and is neatly hinged to the off-side seat (not to the door) so that it can be brought into place and securely fixed when required. All the carriages are painted Russian green, picked out with straw. The wheels and frame are of straw colour, picked out in green. The upholstery is a dark green cow-hide, and the fittings throughout are of brass. An ingenious safety catch is fitted to the door of the tonneau, a spring button being used to hold it securely in place and yet allow it to be easily lifted. The complete weight of the car is 13¾ cwt. The dimensions over all are:—Length, 9 ft. 10 in.; width, 5 ft. 1 in.; height, 5 ft. The price at which this serviceable vehicle is being put on the market is £375, for which money we consider that thoroughly good value is given.

The performances of this type of Chenard and Walcker car, in the past, have been specially noticeable because of the remarkably low fuel consumption shown. In the official consumption trials organised by the *Auto-Vélo* in France early last year, and recorded by us at the time, a 10-h.p. car, carrying four passengers and weighing a little over 21 cwt., ran a distance of 62 miles with a consumption working out at a gallon for 51½ miles. On another run a month later, over the same road, the consumption amounted to a gallon per 44 miles. These figures constitute a record up to the present in fuel consumption trials, and the explanation of them will have been gathered from the foregoing description and explanation of the construction and the system adopted. The Weston Motor Syndicate, whose light American steam cars are already well-known to our readers, have, as already announced by us, acquired the sole agency for these cars in England.

THE 4,000 MILES TYRE TRIALS.

THE report and awards of the Judges in the extensive series of trials of motor vehicle tyres, which, commencing last September, have been running steadily till just recently, are of the highest interest for automobilists. We were only able, owing to lack of space, to give the awards in our last number, and any mere enumeration of awards of this kind is bound to be rather fragmentary and to give an imperfect, if not actually one-sided, impression. The consideration of prime importance which emerges from the Judges' report is that the tyres of all the competitors which endured to the end was very much better than anybody, even in all probability including their makers, anticipated. The trial was not only very extended but very severe. It demonstrates most unequivocally that pneumatic tyres can now be made to stand practically anything. This is a very satisfactory result, as a good deal of loose talk is prevalent, both in the general press and elsewhere, about the extreme cost and unreliability of pneumatic tyres. The Judges' awards will go a long way to duly discount such aspersions, and after the trials if anybody's tyres do not wear satisfactorily it should be regarded as a proof that he has not got proper tyres—not that proper tyres cannot be obtained. A detailed report, furnished by the Judges, gives some interesting information. It will be remembered that the Dunlop tyres obtained the first prize, the Collier tyres coming second. In actual reliability on the road the Collier tyres appear to have been superior, having lost less marks while running than any of the other competitors, and therefore if the test had been confined to mere endurance and running on the road, they would probably have headed the list. These tests, however, were amplified by tests for resilience and tractive effort, and in these respects the Collier tyre was less successful. The experiments made by Professor Hele-Shaw with the British Association dynamometer demonstrated that the Collier tyre, under similar conditions of speed and road surface, required from 15 to 30 per cent. more power than the Dunlop, while the amount of vibration communicated from the road surface to the structure borne by the wheels was also indisputably in excess when the Collier tyre was employed. Doubtless it was its comparative superiority in these points that enabled the Dunlop tyre to carry off the first prize. The following excerpts from the Judges' report comprise its most important features, and enable the reader to appreciate the grounds on which they based their distribution of awards :—

Factors upon which the Awards have been based.—(*a*) One mark was deducted for every minute spent in tyre inflation or repair, whether in the control or on the road; (*b*) Price of tyres; (*c*) Loss of weight; (*d*) Condition as shown by periodical examination and by photographs taken during the Trial and by examination at end of Trial.

The Judges had power to extend the scope of the Trial in any way which they might think necessary in order to arrive at their decision as to which was the best pneumatic tyre. It is claimed for the pneumatic tyre that by its great resiliency and consequent reduction of vibration, the engine, gear, and carriage work are preserved from the constant succession of shocks from road contact which must arise from speedy travelling over the highway; and that consequently cars shod with pneumatic tyres are not so liable to breakdown from engine, gear, or frame failure, and the life of the motor and carriage is considerably prolonged; whilst the comfort of riding and facility of steering are greatly increased. It is beyond argument that the reason why motor owners incur the very considerable additional expense which is involved by the employment of pneumatic in preference to solid tyres, and are willing to suffer the delays and annoyances which may arise from punctures on pneumatic tyres, is because of the additional speed and general smoothness of running which result from the property of absorbing obstacles, which is the main characteristic of a pneumatic tyre. It is possible to manufacture a pneumatic tyre which is practically unpuncturable; but if, in order to avoid puncture, the tread and walls of the tyre are so thick and so unyielding, and therefore sluggish, that the tyre fails to absorb concussion better than a solid rubber tyre, nothing is gained by the use of such semi-solid tyres.

In arriving, therefore, at their conclusions with regard to the best pneumatic tyres, the Judges decided that it was absolutely necessary that the competing tyres should be tested with a view to ascertain how far they possessed the properties which give a pneumatic tyre the preference over a solid tyre. For this reason one of the Judges—Professor Hele-Shaw—arranged for testing the speed and resiliency of the tyres with the British Association dynamometer and recording apparatus designed to be used for this purpose.

(*a*) **Time Spent upon Inflation to make good Ordinary Leakage.**—From the Appendix it will be seen that the Collier tyres (T. 7) lost fewer marks than any others, as one tube only was punctured (hind off on 16th September at Oxford), and there was no need to change an outer cover. The Company's representative replaced the damaged tube by another with a loss of only 26 marks; the total deduction during the Trial being 48 marks.

The Dunlop set, No. T 2, likewise completed the 4,000 miles without changing a cover, but had two punctures. The Honorary Official Observer, reporting upon the puncture on 6th September, states that the Company's representative put his tyre lever through the inner tube when refitting, and mislaid the pump connection, thus occupying 39 minutes. The other occurred on 6th October, when a new tube was fitted to the hind off wheel in 11 min. 50 sec. = 12 marks, and bringing up the total loss of marks for inflation and repair to 87.

None of the other competitors finished the 4,000 miles without change of covers, the Dunlop cars, Nos. T 1, T 3, and T 4, each having recourse to a reserve cover, whilst the Maison Talbot (T 6) used both reserve covers, and also refitted a cover which had been repaired in the garage.

Price of Tyres.—The following is the comparative cost of the tyres which completed the 4,000 miles in pence per inch, calculated as follows :—

$$\frac{\text{Price in pence.}}{\text{Diameter of tyre} \times \text{sectional diameter.}}$$

T 1. Dunlop, fronts, 2*s*. 0·45*d*.; hinds, 1*s*. 10·47*d*.
T 2. Dunlop, fronts, 2*s*. 0·45*d*.; hinds, 1*s*. 10·46*d*.
T 3. Dunlop, fronts and hinds, 2*s*. 0·45*d*.
T 4. Dunlop, fronts and hinds, 2*s*. 0·45*d*.
T 6. Maison Talbot, fronts and hinds, 1*s*. 10·46*d*.
T 7. Collier, fronts and hinds, 2*s*. 0·04*d*.

(*c*) **Loss of Weight.**—The Judges were not able to definitely establish any variation in the weights of the tyres during the Trials by which one nature of tyre could be adjudged superior to another.

(*d*) **Condition.**—The condition of the tyres to which prizes have been awarded was, in all cases, better than was anticipated, and many of them were still capable of further work at the completion of 4,000 miles.

Facility of Detachment.—The Trials for facility of detachment showed that such tyres as were tried for detachability, viz., Dunlops Nos. T 1, T 2, T 3, T 4; Maison Talbot, T 6; Collier, T 7; and Midgley, T 12, were removed with reasonable facility. The Collier tyre (T 7) having 24 bolts attached to it, from each of which a nut and washer had to be removed, necessarily took somewhat longer than the other tyres, which merely depended for their attachment to the rim upon "Boulons" and inflation. The extra thickness and rigidity of the Collier cover also made it somewhat more difficult to manipulate. In the opinion of the Judges the multiplicity of iron and steel bolts and nuts (which are liable to corrosion and becoming set fast from rust) is not desirable, if it can be avoided, for the attachment of a tyre, and the longer the time that elapses between the removals of the tyre from the wheel, the greater the probability of the bolts and nuts rusting up together, as they cannot be effectually protected from wet.

Resiliency and other Tests with B.A. Dynamometer.—The results obtained by Professor Hele-Shaw, using not only tyres that had been through the 4,000 miles, but also new tyres of the same make taken from the reserves of T 2 and T 7 respectively, show most clearly :—

(1) That the excess of power required by the Collier tyre over that required by the Dunlop tyre under similar conditions of speed and road surface varied from about 15 to 30 per cent., and that the greater excess of power was required at the lower speed.

(2) That the vibration communicated from the road surface, whether macadam, wood, or setts, to the structure borne by the wheel was, as shown by the actual records, indisputably in excess when the Collier tyre was used.

Comparative Resiliency as shown by Judge's Inspection.—The instrumental results obtained by Professor Hele-Shaw are entirely in accord with opinions formed by the Judges from observations when both on and off the cars, which opinions had been recorded previously to Professor Hele-Shaw's Trials and Report.

The Automobile Club Quarterly 100 Miles Trials.—These took place on January 24th last, the route being from Piccadilly to the 49½th milestone beyond High Wycombe and Stokenchurch from London and back. The road was very wet and muddy, it raining all day, with a light wind blowing. The hills on which Hill Climbing Trials took place were :—

(*a*) The steep portion of Dashwood Hill, commencing at 33rd milestone and ending at danger board at the top, 1,180 yards, having an average ascent of 1 in 16·0, and including 352 yards of 1 in 10 9.

(*b*) One mile, including Dashwood Hill, commencing at 33rd milestone and terminating at 34th milestone, having a total rise of 241 feet in 1 mile, including 275 yards of a gradient of 1 in 21·7, and 600 yards of a gradient of 1 in 11.

(*c*) Aston Hill on the return journey. Distance 1 mile 1,100 yards, having a total rise of 385 feet, and including 1,910 yards of a gradient of 1 in 21.

The cars taking part were :—

12-h.p. Gardner-Serpollet (the Hon. H. Sturt, M.P., 38, Portman Square, W.), 4-seated 4-cylinder steam vehicle, weight without passengers, 30 cwts. 3 qrs. No records taken of fuel and water consumption. Mr. H. H. L. Lewis, who acted as Hon. Observer, reported ;—"Stopped at 19th milestone to clear out air scoop, which was choked up with mud, at 11.31. Started again at 11.40. Stopped again at 11.50 near 21st milestone to clear out air scoop ; 12.40 (31st milestone) driver turned back and abandoned run."

Humber, Limited, Beeston, Notts.—12-h.p. 4-seated car fitted with 4 cylinders. Water and radiator cooled, electric ignition with accumulators and coil. Transmission : Cardan joint, live axle. Weight without passengers 22 cwts. 2 qrs. No records taken of fuel and water consumption. Speed up to legal limit on outward journey, and nearly so on return journey. Hill climbing speeds with 4 passengers up (*a*) 4 mins. 44½ secs. = 8·48 m.p.h. ; (*b*) 6 mins. 25 secs. = 9·35 m.p.h. ; (*c*) 12 mins. 47⅗ secs. = 7·62 m.p.h. Mr. E. de Wilton, who acted as Hon. Observer, reported ;—"Stopped ⅕ sec. changing gear top of Dashwood. Stopped 2 secs. changing gear on Aston. Stopped 29 mins. between 36th and 35th milestones through want of water. Stopped twice again to fill tank."

Farman Automobile Company, Limited, 104, Long Acre, W.C. 12-h.p. 4-seated **Farman** Car, fitted with two cylinders, pump and radiator, cooled, electric ignition, accumulators and coil. Transmission gear and chain. Weight without passengers, 17 cwts. 2 qrs. Petrol used, six gallons ; water, one gallon. Average cost of fuel per mile, 9*d.* Speed, outward journey up to legal limit, return journey, 9·03 miles per hour. Hill climbing speed (*a*) 7 miles = 5·7 miles per hour ; (*b*) 10¾ miles = 5·58 miles per hour ; (*c*) with four passengers up 14¾ miles = 6·06 miles per hour. Mr. Phil. Paddon, who acted as Honorary Observer, reported :—"Owing to the clutch slipping, two passengers alighted half way up Dashwood Hill. Within 100 yards of top third got out. Two pushed last 100 yards. There was only one stop, and that was for a very bad puncture that took one hour and ten minutes to repair. This was about 30 miles from London. Tyre went in another 10 miles. Last 20 done on flat one. The clutch was sprinkled with French chalk four times whilst the car was running. Also the governors were oiled. Nothing else."

MEMBERS of the Automobile Club will be given an opportunity of discussing the legislative proposals of the Club on March 6th.

A CIRCULAR racing track giving about 6½ miles circuit within 16 miles of London sounds extraordinarily fascinating. A course of this nature has recently been inspected by Messrs. S. F. Edge, Charles Jarrott, J. E. Hutton, and Claude Johnson, and provided satisfactory financial proposals in connection with the scheme can be formulated, it is quite possible it may in the near future become an accomplished fact. The course would include an almost straight flat mile and some gradients, which would afford opportunities of some exciting speeds on the down gradient. Another course suggested is a 10 mile one at Clacton.

LUBRICATION AND LUBRICATORS.*

By THOMAS CLARKSON.

LUBRICATION may be described as the art of making things work smoothly. It is a wide term, covering human as well as mechanical relationships, between which there is a close analogy. The necessity of making things work smoothly is apparent to all, and nowhere does this apply with greater force than in the vitals of an automobile, where unsmoothness of working is a sure cause of trouble and expense. To appreciate lubrication we may with advantage first study the enemy—"friction." Its laws are few and simple, and may be divided into two classes—static and dynamic. The first deals with the friction of rest, and is given by some the not inappropriate name of "stiction" (belts and friction clutches come under this heading). The second deals with the friction of motion. It is with this class that we are more particularly concerned. The friction of motion may be subdivided into rolling and sliding friction. The former relates to ball and roller bearings, the latter to plain bearings. In rolling friction the balls or rollers act in a manner closely analogous to the lubricating medium of a plain bearing by keeping the working surfaces apart. If it were possible to make a ball or roller bearing with absolutely no sliding friction, the use of a fluid lubricant might be safely dispensed with, but there is sliding between the balls or rollers themselves, or between them and the cage employed to keep them in position. The amount of sliding friction is lessened when intermediate balls or rollers are used, but it is not entirely eliminated. The extra complication and cost of these bearings qualifies their other advantages, and the friction of a well-designed plain bearing, properly lubricated and protected, is very much smaller than many people imagine.

The amount of friction between two surfaces sliding together depends upon several things :—

1. The pressure applied to them. 2. The material of the surface.
3. Their smoothness and hardness. 4. Their wetness and dryness.
5. Their temperature. 6. The viscosity of the lubricating medium.

To reduce friction to its lowest degree the surfaces must be as smooth as possible, and that at least one of them should be capable of the highest polish. The degree of polish depends largely upon the hardness of the substance—hence the suitability of case-hardened steel for motion pins and valve mechanism. The surface burnishes like a mirror, and gives its mate no chance of becoming too intimate. Although the amount of friction is generally stated to be independent of the extent of surface in contact, for practical reasons this old law needs qualification. If the surface is large, the pressure per unit area is correspondingly small, and may be quite insufficient to squeeze out the film of lubricant—hence the active surfaces are kept at a respectful distance. But with relatively small wearing surfaces the pressure on the lubricant is proportionately greater. The surfaces possess a more penetrative power, which, if it cannot be checked, will squeeze out the lubricant and permit physical contact. This may become so intimate as to start the force of cohesion, with "scoring" or tearing of the surfaces, as an immediate result. The principal object of lubrication is to prevent such a result. It must not be expected that lubrication alone, however perfect, will make up for errors of design in making the surfaces too small for the work they have to do, but it is possible for a well-lubricated machine of inferior design to do more useful work than an otherwise more perfectly designed machine in which lubrication is defective. Indeed, lubrication is of such primary importance, that a machine with defective lubrication, however perfect otherwise, cannot be described as well made. This applies with special force to an automobile. So much pleasure is lost, and the depreciation in value of a car is so rapid, by imperfect lubrication, that the importance of good lubrication cannot be easily over-estimated.

The lubricant should be clean and free from solid substances. This medium is the only thing that should be permitted to come between the working surfaces. If particles of dust or grit are permitted, their smallness of area and consequent penetration enables them to cut through the film of lubricant, to the detriment of the working surfaces.

Lubricators.—Next, as to the means of securing the most reliable lubrication with the smallest attention on the part of the driver. A lubricator consists of a reservoir and one or more feeders. It may be portable, as in the old-fashioned oil can, which is perhaps the most elementary form of lubricator. Usually the lubricator is fixed close to the bearing it is to serve, or, should this be inaccessible, it may be fixed at a distance, and a connecting pipe used. The use of an oil can is extremely wasteful in lubricant, and should the interval between successive feedings be too long, permanent injury to the bearing is likely to result. Speaking broadly, there are two systems of lubricating a bearing. In the first the rate of feeding is adjusted as far as practicable to the actual requirements. In the second the bearing is liberally flooded, and the large surplus recovered for use again. Lubricators which come under the first category all depend individually for their action upon human adjustment. I am entirely opposed to such human adjustment and individual inspection. The long rows of sight-feed drips which are sometimes seen on a dashboard are veritable instruments of torture, and it is perfectly unreasonable to expect the driver to look at them. With such an instrument the poor driver is between Scylla and Charybdis—either he must largely overfeed, or risk a stoppage and a ruined bearing.

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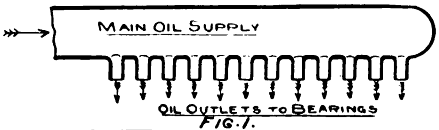
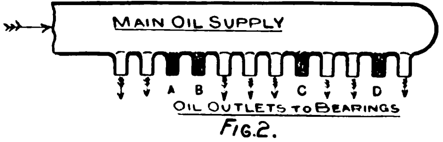
* Excerpt from a paper read before the Automobile Club, January 30th, 1903.

The quantity of good oil necessary to maintain a film between the working faces of a well-constructed bearing is really very small indeed. To approximate the rate of feed to this small quantity means a very small drip outlet, and a very small drip outlet means that a tiny particle of dirt or extra thick oil will stop the supply altogether. To avoid this the feed is habitually extravagant, and the cost for wasted lubricating oil may easily be ten or more times of what is actually used. The system of liberally flooding the bearings and recovering the surplus implies that all the bearings are effectively enclosed, not merely to exclude dust (which is a good thing in itself), but to catch the surplus oil and collect it in a common reservoir.





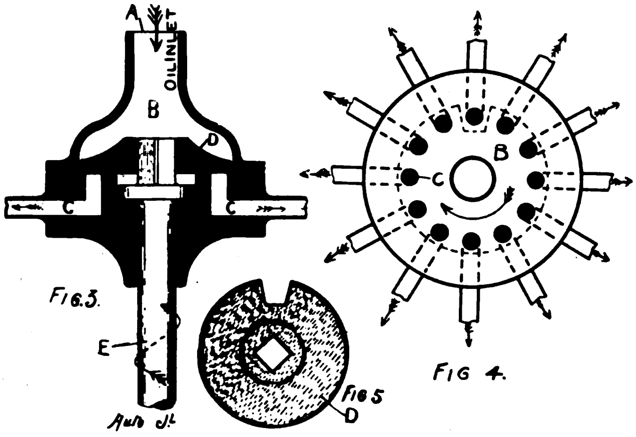


Fig. 1.—When clean and perfectly clear. Fig. 2.—When obstructed at A B C and D the other outlets take the full discharge. Fig. 3.—Section through Clarkson Distributor. Fig. 4.—Plan of valve chest showing radial distributing pipes. The valve is indicated by a dotted line. Fig. 5.—Plan of distributing valve, D.

The oil may be supplied to the bearings either by the splashing of the mechanism in a bath of oil, or the oil may be pumped over the bearings. Both ways have the advantage of starting and stopping the lubrication simultaneously with the running of the machinery, and without the intervention of the driver, which is a correct principle. The waste of oil is extremely small if the case is made properly, and consequently the best quality does not become an expensive item when one gallon will last for a thousand miles. Splash lubrication answers well in some cases, where all of the bearings are in a position to benefit by the splash distribution; but this is not always the case, and the violent agitation of the body of oil tends to preserve in suspension any fine solid particles, either of dirt or metal, which should be allowed to settle.

For the above reasons I advocate pumping the oil under pressure. A force pump working under the extremely favourable conditions of dealing with lubricating oil will run for years without attention, and its action may be instantly tested, at any time when running, by momentarily pressing a button.

The next step is to ensure that the oil which is pumped is going to *all* the bearings. On an automobile I do not advocate a separate pump for each bearing; one pump for all the bearings is enough, only we must be sure they all get a proper share. One arrangement is for the pump to deliver the oil into a distributing main, fitted with branch pipes, which connect with the several bearings. The objection to this is that some of the branch pipes may become fouled after prolonged use, and the rest of the branches will obligingly take their brother's share (see Figs. 1 and 2), or, if some of the branch pipes are longer than others—the short ones take more oil than the longer ones. This means that the circulation in the larger pipes is less vigorous, and this is the first step to becoming sluggish and finally stopping altogether. Such an attempt at equal sharing must fail, and I can only see one effectual remedy for it, namely, to compel each of the branch tubes in turn to take the whole of the oil delivery for a fraction of the time, instead of attempting to take a fraction of the delivery all the time.

Fig. 3 shows a distributor which I have found to answer perfectly. The oil is delivered by the pump into the pipe, A, and fills the box, B; the only outlets are the ring of holes, C, each of which communicates with a bearing. This ring of holes is covered by a circular disc, D, which is slowly revolved by the motor. On one side of the disc a segment is cut out, so as to uncover one hole at a time, and the desired result is accomplished. Care is taken to make the segment wide enough to partially open the next hole before closing the last. Any number of branches may be used. After running over 3,000 miles, a Chelmsford engine fitted with it was taken to pieces and examined. The surfaces were found in perfect condition, and there was practically no wear; the engine was as good as new, and would certainly run a distance equal to the circumference of the earth before needing repair. The consumption of lubricating oil is very small, and the relief from attention to lubricators has added a great charm to driving. The oil is strained each time it circulates, and any solid particles are permitted to quietly settle to the bottom of the oil well, where they can do no harm. A drain tap is provided at the lowest point, and replenishing is done through a large inspection hole in the top of motion case. It is not necessary to carry a reserve of lubricating oil, or even an oil can, except for steering and brake motions. One filling of the well (say a gallon) will last quite a thousand miles on a large car. The same system, with modifications, is applicable to cylinder lubrication. The lubrication of outside driving chains has special difficulties, owing to the exposed situation and the impracticability of properly enclosing them. They work remarkably well, considering their dirty and generally neglected condition, and an occasional bath in paraffin and a subsequent soak in a melted compound of fat and blacklead does fairly well. It would be a good thing if they too could be provided for by the same lubricating system which does the rest of the car; but I have little hope of this being accomplished.

* * *

1,000 Miles Trial for 1903.—The formulæ which we published last week, from the official Journal of the Automobile Club, for the apportionment of marks, were not final. They have now been very materially altered by the Formulæ Committee, the following being the present results of further deliberations:—

Hill Climbing—

$$\frac{3300}{\text{No. of hills}} \times \frac{(6 + \text{No. of pass.})}{1500 + £)} \times \text{average grade per cent.} \times \text{speed miles per hour.}$$

H.P. Performance—

$$\frac{(\text{laden weight, lbs.} \times \text{vertical rise, ft.}) + (\text{length of hill, ft.} \times 35 \text{ lb. per ton laden weight.})}{33{,}000 \times \text{time, minutes.}}$$

Accuracy of Advertised H.P.—

$$250 \times \left(\frac{140}{100} \times \frac{\text{H.P. performance}}{\text{H.P declared}}\right)^3,$$

with a maximum of 250.

Fuel Consumption—

$$\left(25 \times \text{distance in miles} \times \frac{\text{laden weight, cwt.}}{(20 + \text{laden weight, cwt.})} \times \frac{1}{\text{fuel in gallons} \times \frac{\text{pence per gallon}}{12}}\right) - 125$$

Speed—

$$\frac{\text{speed miles per hour} \times (6 + \text{No. of passengers})}{1500 + \text{price, £}} \times 2500$$

Cheapness—

7 for every £1 per cent. below maximum price in class.

Upon full consideration it is announced that the French Automobile Club prefer for the Gordon-Bennett Cup Race a circuit of 100 kiloms. of good roads to a circuit of 150 kiloms. of indifferent roads.

Under the organisation of the Austrian Automobile Club a "Circuit" is to be arranged for the end of May or commencement of June next. The district selected is the Wachau in Lower Austria.

The Brighton Exhibition and Speed Trials are temporarily abandoned pending a more suitable date for holding them being arrived at between the Brighton Corporation and the Automobile Club. May 2nd to 6th, or soon after, is suggested.

The date of the Aix-la-Chapelle automobile week is announced to take place from June 25th to July 1st. The hill-climb will be held on the Yenne Road instead of at the Plainpalais, the latter being deemed too dangerous for the participants. We gave particulars of this event in our issue of January 17th.

An automobile contest, organised by the Austrian Automobile Club, and under the patronage of the Austrian Minister of War, will be held in connection with the Vienna Exhibition on March 19th. The categories will comprise 8-seated omnibuses, commissariat vehicles, delivery vans, and heavy wagons. The course will be over a distance of 50 kilometres.

A professional and amateur status in connection with mechanically propelled vehicles not being recognised by the Automobile Club, they do not propose to recognise disqualifications by the N.C.U., except such disqualifications are for malpractices or unsportsmanlike conduct, in which case the Club is prepared to agree with the N.C.U. to uphold such disqualifications.

In connection with the Udine (Italy) Exhibition, an automobile meeting will be arranged, comprising a mile and a kilometre race, and a road race over a course of 95·300 kiloms., this course being covered three times, making a total of 286 kiloms. Separate categories will be made for cars using petrol and alcohol fuel. The whole course is quite flat, with the exception of a slight rise near Saint Daniele.

100-Miles Trials are to be instituted by the Scottish Automobile Club on the same lines as and under the rules of the A.C.G.B.I. The route for these will be *viâ* Bearsden, Dumbarton, Helensburgh, Whistlefield Hill, Arrochar, Tarbet to Crianlarich, then back *viâ* Ardlui, Luss, Bonhill and Clydebank, without stopping. Only the legal limit will be recognised except on ascending Whistlefield Hill, which on the up grade will be treated as a Hill Climbing Trial.

The official route for Paris-Madrid is likely to be announced shortly, as M. Tampier has now completed his inspection and given in his report. The road selected, although containing some bad places in parts, will also afford an opportunity for the big cars showing off their best paces. From Bordeaux there will be about 175 kiloms. available without neutralisation, and between Magescq and Saint-Geours-de-Marennes there are about 11 kiloms. of ideal surface, practically flat, on which some records should be established if the timing can be officially noted. Throughout the whole course not only is a universal desire shown by hotel keepers, sportsmen, and the public generally to have the race authorised by the French Government, but the event is receiving the keenest support from the municipal authorities through whose districts the race will pass. Amongst the most recent engagements for this event are 4 Pipes, H. S. Harkness with a heavy car, and 9 motor bicycles, viz., 4 Griffons, 2 Bruneaus, and 3 Peugeot Frères.

Much bickering has taken place in the United States amongst a certain class in regard to having eliminating tests to determine the type of car to represent America in the Gordon-Bennett Cup Race. Several have suggested that untried vehicles should not in any case be admitted. Mr. H. S. Harkness, one of the most popular nominees for a place as one of the drivers, is not of this way of thinking. He is evidently a sportsman of the right type. He objects to there being any hole-and-corner favour shown. Writing in respect to this matter he hits out straight from the shoulder, and states that as far as America is concerned there are no well-tried cars, and therefore all should have the same chance to prove what they can do. Those who hope to compete are all building new vehicles expressly for the contest, differing most radically from any type which has at present been placed by them on the open market, therefore there is no reason that these should be regarded as more tried vehicles than the other and less known makes which may be put forward for an eliminating test. Mere runs on tracks or selected roads have no bearing on what a car can accomplish in a give-and-take course like the Gordon-Bennett Race. Mr. Harkness was one of the earliest to volunteer as a driver and to deposit his entrance fee with the A.C. of America on the understanding that all who may volunteer should be given an even fair trial to make one of the team, the decision to rest entirely with the Committee in charge. Sport, as Mr. Harkness says, should be in a race like this the first consideration, and manufacturers' advertising secondary. Let all who have volunteered compete, and the more rigorous the trials the better. The same speed difficulty with the authorities pertains in America as in Great Britain, in regard to making the eliminating tests on the public highway, and Mr. Harkness suggests that insomuch as the event is of an international character, speed restrictions should be waived for part of a day, say from Boston to New York, to enable the relative merits of the various cars to be demonstrated. Those cars which, going at full speed, can successfully take the "thank-you-ma'ams" met with in such numbers on the American roads, will certainly meet the requirements abroad, whatever the course may be. Mr. Harkness's letter is not only a patriotic but a manly appeal.

One of the new double-deck Milnes omnibuses is to have a thorough and practical test at the hands of the London Road Car Company. As a preliminary to the trial, last week the Directors and the Inspection Staff of the Company were given a sample of the powers of these very fine vehicles, being taken by Mr. Burford from Charing Cross to Shepherd's Bush and back in 1 hour and 20 minutes, including stops.

Sir Edward Jenkinson has not resigned his director's seat on the Daimler Motor Company as reported in a contemporary.

Amongst the assets of Mr. A. S. Rowe, who has recently become so notorious in connection with the great Fingall frauds, is a motor car.

On the 19th instant a paper is to be read by Mr. H. A. Jones on "The Electrical Gearing of the Panhard Car," at the Bradford Conservative Club.

The Roots Oil Motor and Motor Car Company, Limited, have now removed to their new premises at Chicheley Street, York Road, S.E., within three minutes' walk of Westminster Bridge.

Synchronising with the opening date of the Automobile Show at the Crystal Palace, the through bookings, including entrance to the Palace, were resumed by the railway companies.

The Saracen car is the name under which for the future the Reading steam car will be known in this country. Mr. J. L. Sardy, of Snow Hill, has the exclusive agency in Great Britain for this system.

The Caution Boards to be adopted by the Automobile Club will be diamond shaped, the signs being similar to those of the French Chambre Syndicale, which we published on November 22nd last.

Messrs. W. R. MacTaggart and Co., of Dublin, have opened a London house, at 48, Wells Street, Oxford Street, W., where they will store and distribute the F.N. Motor Bicycles, for which they hold the agency.

For the future the Waverley electric cars from America will be entirely in the hands of the Locomobile Company of Great Britain. Mr. W. Letts, who arrived in London on Saturday last, during his visit to the States secured the whole of the Waverley exhibit at the Madison Square Show, which at the time of his visit was in full swing.

The Oldsmobile Company of Great Britain have changed their name. They are now known as the Anglo-American Motor Car Company (Limited), and will hold, as we announced some short time back, the exclusive agencies in Great Britain for the following systems:—The Oldsmobile, Winton, Baker Electric, and the Vehicle Equipment Company, in addition to the "Royal" motor bicycles.

A motor cycle tour is being arranged by the Motor Cycle Committee of the C. T. C. for Easter. The daily run will be about 100 miles, the route tentatively selected being from London to Salisbury, Exeter, Bristol, Gloucester, Worcester, Oxford, and home. The start will be on Thursday, April 9th, and the finish on the evening of the Bank Holiday.

The Goodyear Tyre Company are justifying their faith in their tyres by issuing a guarantee for 1903 with every tyre sold by them during the year for a distance of 3,000 miles under ordinary conditions, and for one year from delivery subject to specified reservations in regard to the Company being entitled to repair the tyre free of charge, or supply a new tyre or cover under certain conditions.

Long Acre is, by degrees, being metamorphosed. One by one the old-established coach-building establishments are being ousted, their place being taken by depôts for automobile manufacturers and agents. The latest to migrate to this locality, which promises to become one of the chief centres of automobilism, is the Ariel Motor Company (Limited), who have opened premises at 132 and 133.

In several districts motor car services are to be organised during the coming season. By way of a start, last week South Croydon and the Sutton Corner of Epsom Downs were brought into closer touch by the inauguration of a service of automobiles, *viâ* Carshalton. Several local agriculturists in Devonshire are arranging for handling their market produce between Honiton and Tiverton Junction by means of motor wagons.

A strange discovery has been made at Lambeth. An automobilist was summoned before Mr. Hopkins on the usual charge. The phenomena accompanying the progress of a motor car were, according to Mr. Hopkins, most unusual. He arranged them in order of increasing rarity. "People," he said, "were scared, dogs were run over and trustworthy witnesses had been brought forward by the police." This is, indeed, a most astonishing occurrence.

Twice within the last week has His Majesty the King taken advantage of the great convenience afforded by the automobile. In the first case both the King and Queen drove over from Windsor to High Wycombe, where they lunched with the Earl and Countess Carrington, at Daw's Hill Lodge, returning shortly afterwards by the same means. On Saturday His Majesty unexpectedly drove up from Windsor to Buckingham Palace on his car, returning afterwards by a Great Western ordinary train in the afternoon.

As part of the arrangements made, before the sudden and much regretted indisposition of King Edward, for entertaining their Majesties the King and Queen during their visit to Chatsworth, a motor car was provided in which part of the journeying was to be accomplished. Captain Holland, the Chief Constable of Derbyshire, was in attendance at Chatsworth with his 12-h.p. Beaufort car, to ensure that all the police arrangements were perfect during their Majesties' visit. The inhabitants of the entire district are hopeful that the visit is not abandoned, only postponed.

Berners Hall, at the Agricultural Hall, will be occupied during Mr. Cordingley's Automobile Exhibition, from March 21st to the 28th next, by the Aero Club of Great Britain and Ireland. This Society has arranged to instal an Exhibition of models of balloons, airships, &c., on the lines of the French Aero Club's Show. The Automobile Section is already shaping well, the whole of the ground floor having been fully allotted. Considerable attention will be given to heavy automobilism, the exhibitors who have made a special feature of this side in the industry including Messrs. Brown and May, The Yorkshire Steam Vehicle Company, The Straker Steam Wagon Company

Savage Brothers, The Hydroleum Company, Coulthard and Co., Mann's Steam Wagon Company, The Lancashire Steam Motor Company, Brightmore Motor Company, Fodens, Limited, and the Wartburg Lurries.

At the meeting held last Saturday at Norwich, when Mr. G. M. Chamberlain presided, it was unanimously resolved to form the Norfolk Automobile and Launch Club. The election of a president and vice-presidents was postponed. Mr. Chamberlain was elected Chairman of the Club and Committee, the following gentlemen being appointed to the Committee :—Baron de Barreto, Messrs. E. T. Boardmae, Ernest Estcourt, W. R. Spelman, J. Griffin, H. R. Fletcher (Norwich), H. Chamberlin (Yarmouth), Frank Morris (Lynn), Dr. Belding (Dereham), Col. Forbes Eden (Cromer), the Rev. J. A. L. Fellowes (Thetford), and Mr. George Sillem (Long Stratton). Dr. Burton Fanning was elected Hon. Treasurer and Mr. G. N. C. Mann, of Norwich, consented to act as Secretary until a permanent appointment could be made. Mr. Clark undertook the duties of Secretary for the Launch Section. The Club starts with a membership exceeding fifty.

The Yorkshire Automobile Club had their Annual General Meeting last week at Leeds, when Mr. Harrison Benn, of Clayton, the Vice-President of the Club, occupied the chair. Mr. Benn, in referring to the great progress which had been made in automobilism during the past year, spoke very strongly of the importance of sanction being accorded for the Gordon-Bennett Cup Race to be run in Ireland, suggesting that all the malcontents should be induced to have a ride in a good automobile, when he was sure that all opposition would at once be thrown to the winds. For the ensuing year the following officers were elected :—President, Earl Fitzwilliam; Vice-presidents, Lord St. Oswald, Mr. Harrison Benn, Mr. T. E. King, Mr. A. W. M. Bosville, and Mr. H. R. Kirk; Committee, Mr. A. J. Greenwood, Mr. R. Winn, Mr. E. Faiers, Mr. W. Jackson, Mr. H. A. Jones, Mr. J. Whitaker; hon. secretary, Mr. A. W. Dougill; hon. treasurer, Mr. L. Hey; hon. solicitor, Mr. Claude Leatham. The Club has increased its membership during the past year from 70 to 120.

An interesting test journey was made last week with a 20-h.p. Gardner-Serpollet omnibus from Paris to Melun and back, a distance of 100 kiloms. The vehicle, which is in use by one of the Paris schools, on this occasion took M. Serpollet and a number of Press representatives, including M. Georges Prades, of *L'Auto*—altogether eleven passengers on the outward journey and twelve on the return. The weight of the vehicle unladen is 2,220 kilogs., and with passengers 3,200 kilogs. For the 100 kiloms. 56 litres of petrol were consumed, giving ·56 litre per kilom. and ·175 litre per ton kilom., making the cost for a suburban service outside Paris therefore ·168 per kilom. and ·0.425 per ton kilom. The cost of fuel per passenger for the entire distance was 1f. 40c., the time occupied being 3 hours 26 minutes, giving an average of 29·500 kiloms. per hour. The speed varied from 25·500 kiloms. on steep grades to 40·444 kiloms. per hour on the flat.

The profits of the New York Automobile Show just closed are stated to be £12,000.

Thirty-five thousand invitations are to be issued for the opening ceremony of the Belgian Automobile Salon.

A number of the workmen of the Mors Company came out on strike last week owing to a trivial dispute with one of the foremen of the establishment.

Dr. Julian Chase, of Rhode Island, has been elected president for 1903 of the American Automobile Association, Mr. Winthrop E. Scarritt declining re-nomination for the position.

The Searchmont-Fournier Automobile Company have dropped the "Fournier" part of their title, M. Fournier having severed his connection with the Company more than a year ago.

An automobile service is to be inaugurated shortly in Sydney, N.S.W. The vehicles employed will be supplied by the Knowles Automobile and Power Company, of Buffalo, U.S.A.

"Santos-Dumont X." is in course of construction, and its completion is promised by April 1—ominous date. This is the public service air-ship which M. Dumont has for some time threatened to launch.

An automobile section is included in the International Exhibition being held at Athens from April 7th to October 13th. The commissioners for the United Kingdom are Messrs. Charles Atkins and Nisbet, 1, Water Lane, Great Tower Street, E.C.

The French Dunlop Company are putting down an instalment for the manufacture of motor tyres, similar to the plant which it has taken the English Dunlop Company two years to evolve. It is expected to be completed by June of this year.

What is said to be the smallest electric automobile in the world has just been constructed for the sons of Mr. George Gould, the New York millionaire. It is 4 feet long by 3 feet wide and under 4 feet in height, and is stated to be able to cover 20 miles with one battery charge.

Mr. and Mrs. Chamberlain have experienced the advantages of a motor car during their visit to South Africa. Last week, with Kimberley as a centre, they made a number of visits to interesting spots by this means, covering a distance which, under any other conditions, it would have been impossible to have accomplished.

A grand procession of automobiles is to defile before the German Emperor on March 7th in connection with the Berlin Automobile Exhibition. The ceremony has been officially sanctioned by the Emperor, and he will receive an address from the President of the German Club and an album containing the names of all the participants in the display.

The Madison Square Garden Automobile Show, just held in New York, has proved the most important and successful exhibition held in the United States. Every American maker of note was represented. That the Americans fully appreciate the commercial importance of the automobile was amply demonstrated by the exhibits, which showed a great advance in vehicles of this type, particularly of the heavier class. The light car builders also had several surprises, and the secrecy which has hitherto largely prevailed in the States in connection with the working parts of the machinery seems to have disappeared, as chassis and separate engines and parts are staged for the first time on several of the stands. Artillery wheels have gone forward in favour, it being generally conceded that wire wheels have not the necessary staying powers for work outside American towns. The chief exhibits were made by the Locomobile Company, the White Company, United States Long Distance Company, the Peerless Manufacturing Company, the Olds Motor Company, the International Motor Company, the Rainier Company, and the Winton Company. The grounds attached to the Exhibition building were largely used by the leading firms for demonstration purposes, and in spite of the severe cold prevailing, proved of considerable practical value in promoting business.

LAW REPORTS.

British Motor Traction Company, Limited.—Receiver Appointed.—In the Chancery Division, on Tuesday, Mr. Douglas applied to Mr. Justice Farwell in the action of Lawson *v.* the British Motor Traction Company, Limited, for the appointment of a receiver and manager of the defendant Company. The plaintiff was the holder of debentures for £7,750, out of a total issue of £50,000. The Company was incorporated in August, 1900, and in September following the debentures were issued. The moneys secured became payable if default was made in the payment of interest for twelve months, and that event had happened. Counsel read an affidavit in support of the motion, in which it was stated that the business of the Company was being carried on at a loss, and the security of the property comprised in the debentures was in danger. It was necessary, therefore, for the protection of the debenture holders to have a receiver and manager, and that the business should be continued with a view to a sale and possible reconstruction of the Company in the interest of the debenture holders.

For the defendant Company Mr. Ashton Cross offered no opposition to the appointment of a receiver, but he did not think that there was any necessity for a manager, as, so far as he could see, there was nothing to manage. The works were shut up.

Mr. Justice Farwell appointed Mr. Baker to be receiver, but was unwilling to appoint a manager under the circumstances. He gave liberty to apply in Chambers for a manager if plaintiff was so advised. The receiver would be at liberty to take possession at once, the plaintiff undertaking for his receipts until security was given.

Motor Wagons and a Smoke Nuisance.—At the Bolton County Police Court, before Mr. J. R. Barlow (presiding), and Major Greg on the Bench, William Cowap, a motor car driver in the employ of the Manchester Motor and Transport Company (Limited), was charged at the instance of the police with driving a locomotive not consuming its own smoke.

The case for the prosecution was conducted by the Chief Constable, who called P.S. Brown. He alleged that a large quantity of steam and smoke was emitted from the boiler. Mr. W. E. Rowcliffe, Solicitor, Manchester, who appeared for the defendant, pleaded "not guilty," and raised the point that this was a light locomotive under 3 tons unladen, and, therefore, the Act of 1878, Part 2, Section 30, did not apply, and, further, that if steam had been emitted it was only due to a temporary defect in the valve, and that steam was only visible in consequence of the day being particularly cold and frosty.

The charge of emitting smoke was absolutely denied. In support of this statement Mr. Samuel Wilson, managing director of the company, was called, and stated that the best possible coke and coal were used on their wagons, and produced certain documentary evidence in confirmation of this, and further stated that the company had 18 wagons running round about Manchester using similar fuel, and no complaint had ever been raised against them.

During the course of the proceedings Superintendent Leeming intimated that he was prepared to withdraw the summons on payment of costs, 8*s*. Whilst adopting this suggestion, Mr. Rowcliffe stated that it seemed somewhat like a verdict of "Not guilty, don't do it again." The summons was therefore withdrawn.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

ONE SHOW FOR MOTOR CYCLES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—To the motor cycle manufacturers and traders the show question is now one of the utmost importance, as the vendors of motor cycles are in a worse position than the vendors of either cycles or motor cars. Motor cycles, being partly cycles and partly motors, put in an appearance at both cycle and motor shows, and with two cycle shows and three motor shows every year this necessitates an immense direct expense, in addition to time and trouble. The magnificent show being held at the Crystal Palace, supported by firms who have agreed to exhibit at one show only, and which is proving such a complete success, and the failure of the Earl's Court Exhibition which was supported by a few exhibitors who were not agreed on the one show question, convinces me that the time is now ripe for a similarly satisfactory state of affairs to be arranged in connection with the motor cycle trade. I do not make any suggestion as to how, when, and where we should exhibit, as these are matters to be arranged and discussed by a trade committee, but I do think that every manufacturer and trader should now make up his mind to obviate the present unnecessary expense of a multitude of shows by agreeing to exhibit at one only per annum.

Yours faithfully,
ERNEST ARNOTT.

Werner Motors, Limited,
151A, Regent Street.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Anglo-American Motor Car Company (Limited).—Capital, £20,000 in £1 shares. Object, to carry on the business of manufacturers of, and dealers in, automobiles, motor cars, carriages, cycles, electric storage batteries, electric motors, rubber tyres, and the like.

Bat Motor Manufacturing Company (Limited), 53, Beckenham Road, Penge.—Capital, £30,000 in £1 shares (22,000 "A" preference, 3,000 "B" preference, and 5,000 ordinary). Object, to adopt an agreement with Batson's Patent Syndicate (Limited), its liquidator, and J. B. Burkett, and to carry on the business of motor and cycle builders, &c. The first directors are J. B. Burkett, D. C. Goodswin, W. Worne, and S. R. Batson (managing director).

Collier Tyre Company (Limited).—Capital, £100,000 in £1 shares (50,000 preference). Object, to acquire certain patents in pneumatic and other tyres, for motors, cycles, cabs, carriages, and other vehicles, to acquire the business of the Collier Twin Tyre Company, Limited (incorporated in 1900), &c. The first directors are W. Baker, J. Purdie, T. M. Harvard, T. Evens, and A. T. Collier.

Goodyear Tyre and Rubber Company (Limited).—Capital, £5,000 in £1 shares. Object, to carry on the business of dealers in rubber, rubber goods, tyres for motor-propelled vehicles and cycles of all kinds, &c.

Jehu Motor Company (Limited), 31, Brooke Street, Holborn, E.C.—Capital, £1,000 in £1 shares. Object, to carry on the business of dealers in motors, horseless and other carriages, vehicles, cycles, &c. The first directors are C. Clayton and J. T. Clarke.

Petrol Motor-Power Company (Limited), 6-7, Singer Street, E.C.—Capital, £15,000 in £1 shares. Object, to adopt an agreement with Davis, Allen, and Co. (Limited), A. G. Davis, and others, and to carry on the business of dealers in motor-propelled vehicles and cycles of all kinds. The first directors are A. G. Davis (chairman), W. C. Allen, and H. N. Allen.

J. R. Richardson and Co. (Lincoln), Limited.—Capital, £10,000 in £100 shares. Object, to carry on the business of motor car manufacturers, makers of motor and other cycles and carriages (whether propelled by steam, oil, petrol, gas, electricity, or other motive power), engineers, electricians, &c. The first directors are C. W. Pennell, J. R. Richardson (permanent managing director), and W. S. Richardson.

West Penwith Motor Company (Limited).—Capital, £5,000 in £1 shares. Object, to take over the business carried on in West Penwith Cornwall, as the West Penwith Motor Company. M. J. Longinotto is the permanent governing director.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

Offices: 44, St. Martin's Lane, London, W.C.

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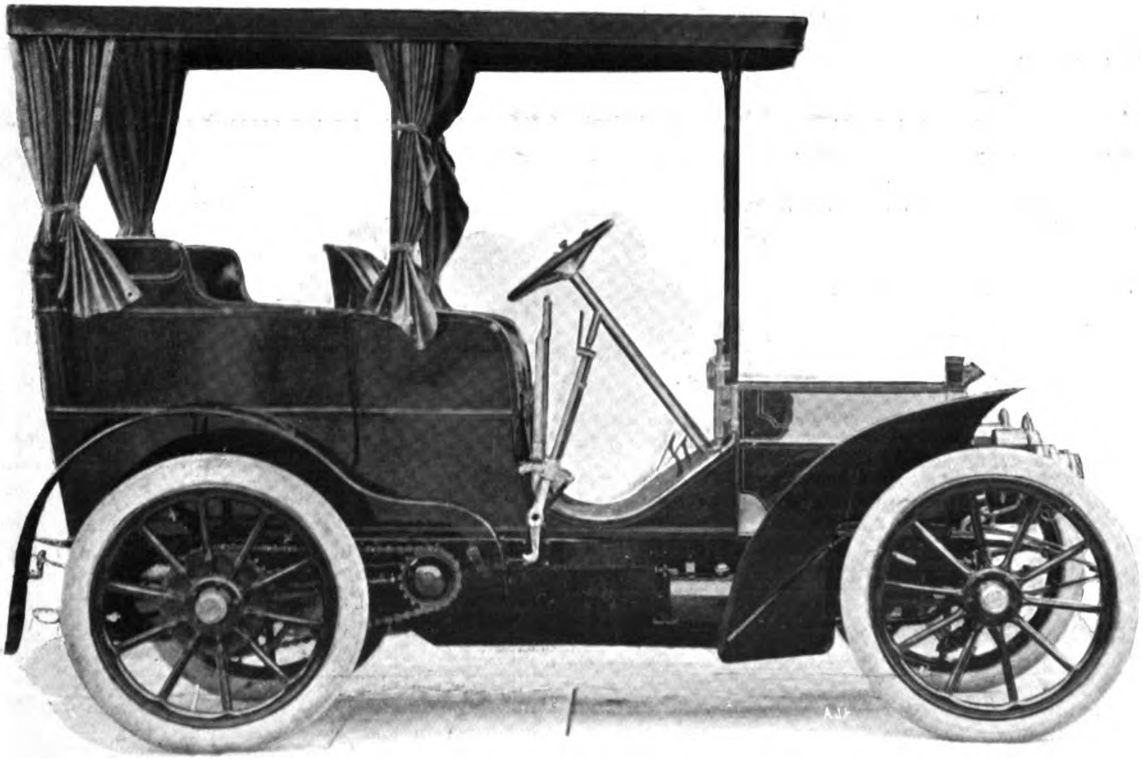

The 18–22 Horse-Power Mercedes—1903 Type.

THE AUTOMOTOR JOURNAL.

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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to The Editor of "The Automotor Journal," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.	
Feb. 20 ...	"Motor Bicycles." Paper by Mr. Mervyn O'Gorman.
Feb. 27 ...	"Recent Development in the Modern Automobile." Paper by Mr. H. R. Sennett. Annual General Meeting.
March 13...	"The Motor Problem a Road Problem." Paper by Mr. W. Rees Jeffreys.
August ...	Tourist Motor Bicycle Reliability Trial.
September	The 1,000 Miles Trial.
1904	Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
Feb. 13–21 ...	Manchester Cycle and Motor Show.
Feb. 19 ...	Consumption Trials (100 kiloms.) *L'Auto.*
Feb. 22–28 ...	Pau Automobile Week.
March ...	Competition of Silencers (A.C. de F.)
March ...	"Criterium du Quart de Litre" (*L'Auto.*)
March 8–22 ...	Berlin Automobile Exhibition.
March 16–30 ...	Vienna Automobile Exhibition.
March 20–28 ...	"Criterium des Transports Automobiles." 1,107 kiloms. (*La France Automobile*).
March 21–28 ...	Cordingley and Co.'s Exhibition, Agricultural Hall.
March 28–April 5	Nice Automobile Week.
April 16–20 ...	A. C. de Touraine Tourist and other Trials.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 12 ...	Paris-Madrid. Start of Tourist Section.
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June ...	Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18–23 ...	Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 25–July 1 ...	Aix-les-Bains Auto Week (Auto Club du Rhone).
July 9 ...	Gordon-Bennett Cup Race.
July 19 ...	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August ...	Circuit des Ardennes.
September ...	Udine Exhibition (Italy).
Oct. 15–21 ...	Leipzig Exhibition.
Nov. 15 ...	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

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PASSING EVENTS.

THE GORDON-BENNETT RACE. AN APPEAL.

The Automobile Club do not intend to give foreign competitors in the Gordon-Bennett Race any pegs to hang their hats on about the badness of the road if they can help it. It is pretty good generally, but there are one or two places where it is not above reproach. Some of the Gordon-Bennett course of last year was far from being beyond reproach. No reproaches, in fact, were adequate to do it justice. But that is no reason why the Irish course should not be made as good as possible. The Automobile Club have organised a subscription list for the purpose. Mr. Goff and Mr. Johnson have ascertained from the County Surveyors of Kildare and Queen's County that it would be possible in places where the road is not all that might be desired to have a new surface put on with the assistance of steam rollers at about £10 per mile. The present subscriptions are to be limited to a maximum of 10*s.* a head, and we are opening our columns to receive the names of intending subscribers, and the office to receive their subscriptions. It is a cause which every automobilist ought to have at heart. There is probably not one in the country who is not anxious for the race to be held in the British Islands. A handsome subscription list for the purpose will show that English automobilists are really the sportsmen they are believed to be, and that they are not disposed to take advantage of any benefit that might accrue to the stronger English vehicles by running the race on indifferent roads. Above all, all the money subscribed will be benevolently spent. It will practically all be employed on labour in a poor district of a poor country, and the result will be permanent benefit to the roads, which will last long after the race has been run. We understand that other automobile papers are also receiving subscriptions, and we trust the readers of THE AUTOMOTOR JOURNAL will show up well among the others. We have opened a subscription list on the next page, and subscribers' names will be published weekly as received.

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THE prospects of the race still continue to be encouraging. A leading automobilist recently interviewed at the Crystal Palace was most enthusiastic, particularly about the running a speed mile in Phœnix Park. No special Bill will be needed for that, the sanction of the Board of Works being sufficient. It will make a grand day's holiday for Dublin, and if automobilists never saw enthusiasm before they would certainly see it then. The Irish people never seem to have been so united on any subject before as in favour of the great race. It is not the prospect of the money it will bring that is mainly influencing them, or, perhaps, influencing them at all. That inducement has been put forward on this side of the water. It is the prospect of the fun and the sport wholly and solely and altogether.

◆

WE note with satisfaction that the Executive Committee of the Automobile Club is very forcibly putting its foot down to prevent intending competitors for the Gordon-Bennett Race running over the proposed course at high speed before the race, and Sir David Salomons, Chairman of the Foreign Relations Committee, has addressed a letter to the President of the Sporting Commission of the Automobile Club of France, pointing out the necessity of prohibiting any such proceedings. Of course, intending competitors will not be debarred from surveying the course at the legal speed, but it is quite unfair for any of them to endeavour to gain advantage by practising at full speed on the actual course. It would be unsportsmanlike even to attempt it, and we feel sure that after the action of the Executive Committee none of the competitors will attempt it, and that therefore the penalties of disqualification and suspension threatened will prove superfluous. It would be simply nothing short of wicked to attempt anything of the kind on Irish country roads. The small local traffic, particularly that of two-wheeled pony and donkey carts, is much greater in Ireland than in England, especially on market days, and in addition horses, mules, and donkeys are systematically turned out to browse on the roadside, and accidents would be almost certain. A few accidents would have a very deleterious effect on the attitude of the country people, which is now all that can be desired. The prohibition is absolutely necessary, and must be rigidly observed. Of course on the day of the race, when everyone has adequate notice, matters will be quite different.

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A SUGGESTION has been put forward that the troops from the Curragh Camp might be usefully employed for keeping the course on the day of the race. It would, of course, be very good fun for the soldiers, but we cannot regard it as a tactful proposal. The army is very popular in Great Britain. For various reasons, which cannot be referred to without trenching on the domain of politics, it is the reverse of popular in Ireland. If the idea were to become prevalent among the country people that they were to be kept off the roads during the race by the "red coats," it would go a long way to diminish the enthusiasm which the project has evoked. We hope that those who have the arrangements in hand, and who have hitherto so tactfully and courteously carried on their propaganda, will give their most serious attention to this point. If carried out the proposal might lead to friction, to say the least.

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ADDITIONAL evidence of the anxiety felt in all parts of Ireland that the race should be held in the island, with a slight suggestion of local rivalry thrown in, is accorded by the Kerry County Council's declaration that they can provide a better course of 116 miles round than that already selected in Kildare and Queen's County. We understand that the Club secretary has gone to survey the proposed course, but we would submit that unless found very distinctly superior, it would be a pity to abandon the road already suggested. Local feeling must be propitiated at all costs, and the people of Kildare and its neighbourhood are likely to be badly disappointed if that neighbourhood is abandoned.

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THE petition to the House of Commons in favour of an enabling Bill to permit the race to be held, and which is very ably drawn up, is now procurable. Copies may be inspected at the office of this journal, 44, St. Martin's Lane.

◆

A ROYAL COMMISSION ON LONDON TRAFFIC.

IT will be satisfactory to London automobilists to learn that a Royal Commission has been appointed to enquire into the means of locomotion and transport in London and to report—

(*a*) As to the measures which they deem most effectual for the improvement of the same by the development and inter-connection of railways and tramways on or below the surface, by increasing the facilities for other forms of mechanical locomotion, by better provision for the organisation and regulation of vehicular and pedestrian traffic, or otherwise; and

(*b*) As to the desirability of establishing some authority or tribunal to which all schemes of railway or tramway construction of a local character should be referred, and the powers which it would be advisable to confer upon such a body.

The Committee comprises an influential *personelle*, including Sir John Dixon Poynder, Earl Cawdor, Viscount Cobham, Lord Ribblesdale, and others, under the presidency of Sir David Barber. No class of the community will be more benefited than automobilists by the introduction of regulations calculated to diminish even to a small extent the preposterous congestion which the anarchy allowed to prevail in London streets produces, but the subject is a difficult one, and Royal Commissions do not work with great rapidity. Its effective solution does not altogether appear to be guaranteed by the choice of the Committee, which, though influential, as we have pointed out above, consists mainly of railway magnates. Railway directors do not seem to be the most ideal class of people to select for dealing with roads. In fact, were it possible to suppose that the present Government could be capable of a joke, they might be suspected of indulging a vein of subtle humour in their selection.

NOT a single representative of automobile interests is on the Committee, nor any representative of the Roads Improvements Association. Considering the amount of work that body has undertaken on the subject in question, and the energy it has displayed, this omission is distinctly unfortunate. Two years ago Mr. Balfour wrote a letter to the Press in which he strongly advocated the view that the solution of the problem would be found in the extensive employment of automobiles and the construction of radiating thoroughfares We dealt with his views at the time, but it is as well to bear in mind that this is the Prime Minister's opinion. It makes it more difficult to understand why the Government should have omitted to include a single representative automobilist on the Committee. The Roads Improvement Association has made a serious attempt to realise a part of Mr. Balfour's suggestion with a circular road added to the radiating highways he proposed. We dealt appreciatively with these suggestings in our issue of Jan. 3, 1903, and we have nothing to add to what we then said on the subject.

ENTROPY—WHAT IS IT?

ENTROPY has something to do with thermo-dynamics. But we should not like to say anything further about it, for since Mr. Swinburne's address to the Institute of Electrical Engineers, in connection with which we referred to the subject, a controversy has absolutely raged in the columns of the electrical papers between professors who are each bent on showing that Mr. Swinburne and the other professors are all wrong on the subject, though, curiously enough, they none of them enter on a definition of what it is. This is unfortunate, since as entropy is said to be involved in the thermo-dynamics of the heat engine, and in consequence of the internal combustion engine, it should be a subject of interest to automobile engineers. They, however, will probably be content to leave the subject alone until the professors have settled between themselves what it is, or even whether there is such a thing at all. Never since the days of the Nominalists and Realists, when armies took the field for or against the Secundum Quid has there been such a discussion. The old description of metaphysics—as one man talking about what he does not understand to another who does not understand him—is a quite inadequate comparison. When Mr. Swinburne wants a little fun he generally takes a large red herring and drags it across the trail of some favoured fetish of the professors, and off they all go full cry after it. Mr. Swinburne sits quietly and smiles, and incidentally he gets a good advertisement. It is a curious fact that, though the professors do not agree as to what entropy is, they have got an integral equation for it. It is :—

$$\int_0^\infty JS\,dt = 0$$

and we are told by Mr. Evershed that it conveys a profound truth to the mathematical and, perhaps unduly pessimistic, mind. An interesting feature of this equation is that it involves the symbols JS, which, as it happens, are the initials of Mr. Swinburne. Obviously when Clausius first proposed this equation he was in the enjoyment of the gift of prophecy.

◆

AT the request of the Editor of the *Electrician*, Sir Oliver Lodge has entered what the *Electrician* terms the breach, though, perhaps, it might be more suitably described as the arena, for the purpose of clearing up once and for all what entropy is, and he expends some seven columns of the *Electrician* in doing so. We do not find Sir Oliver's usual lucidity in his article on this terrible question. He tells us what change of entropy is, and what constitutes increase of entropy, but nowhere does he plainly say straightforwardly any more than the numerous other professors what entropy *is*. When Sir Oliver Lodge makes a pronouncement on such a subject and we fail to understand him, we think the matter may fairly be given up as practically if not absolutely incomprehensible.

THE 1903 TYPE 18-H.P. MERCEDES CAR.

OUR frontispiece this week shows the first of the new Mercedes vehicles to leave the works. It has been sent to Mr. Mercedes at Nice. We gave some particulars of this machine in our issue of January 24th, and are able to supplement this with a few additional data. The cylinders have a bore of 110 mm., and the stroke is 140 mm. The normal speed of the engine is 1,000 revolutions per minute, and the degree to which the inlet valves are opened is varied. The front wheels are fitted with Continental Clipper tyres, 910 mm. by 90 mm., and the rear wheels 920 by 120 mm. The wheel base is 2,330 mm., and the weight, without water and petrol, is 1,040 kilogs. The radiator has a capacity of 11 litres. Writing from his garage at Park Road, N.W., Mr. E. W. Hart informs us that he will have samples of these vehicles on his stall at the forthcoming Exhibition at the Agricultural Hall. He also hopes to be able to show one of the 60-h.p. cars as well.

THE HORSE AND HIS MOODS.

THESE horse-drawn vehicles are terribly dangerous things. A brougham propelled by this antiquated method of traction was on Wednesday conveying a City merchant to his office in the City. On the Victoria Embankment the horse did a bolt. Its friends and patrons declare that it was terrified by a passing river steamer. River steamers are now so unusual that perhaps horses are beginning to get frightened at them again. But we don't think that was the real explanation of the horse's conduct, as it appeared to some onlookers to be not terrified, but infuriated. At the end of the Victoria Embankment a policeman in all his majesty was holding up the traffic, amid it being a motor-car, and at this we are informed the "infuriated horse" made a dash. That was probably the original cause of its proceedings. Not terror at the unfamiliar Thames steamer, but hatred for its trade rival was doubtless the impelling force that inspired the horse's attack. Modern motor vehicles, however, are stoutly built. It successfully resisted the onslaught, and the horse and brougham came off second best, the brougham being badly smashed and the City gentleman having to climb out of the window as it lay on its side. We do not learn that the reactionary horse was injured. Perhaps, in his next incarnation, he may become a justice of the peace on the Worthing bench, if that institution is then in existence.

GORDON-BENNETT RACE. IRISH ROAD FUND.

Limited to subscriptions of 10*s*. per head. (*See* page 167.)

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THE THORNYCROFT 10-H.P. AND 20-H.P. PETROL CARS.

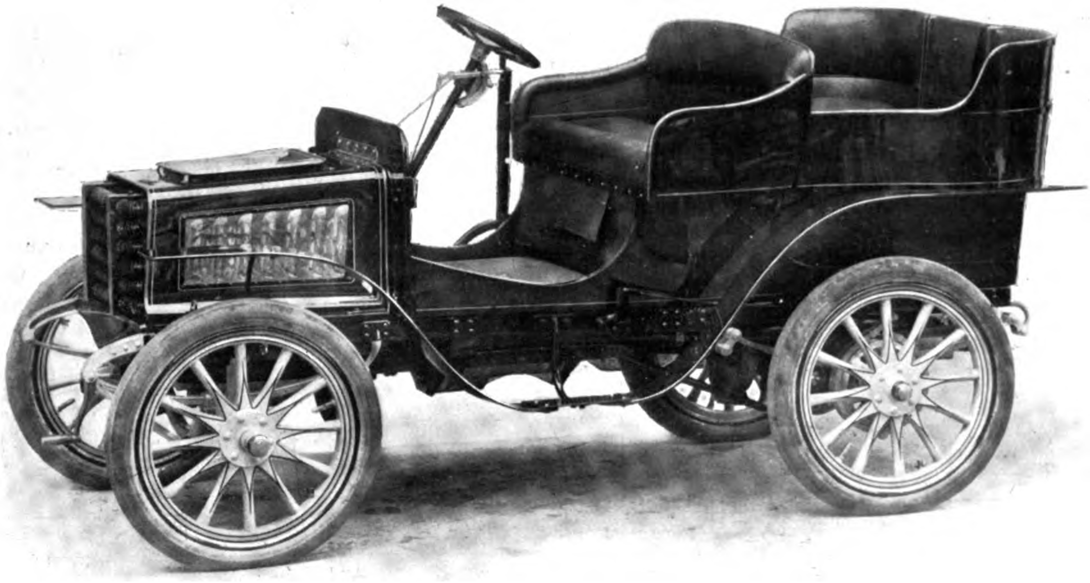


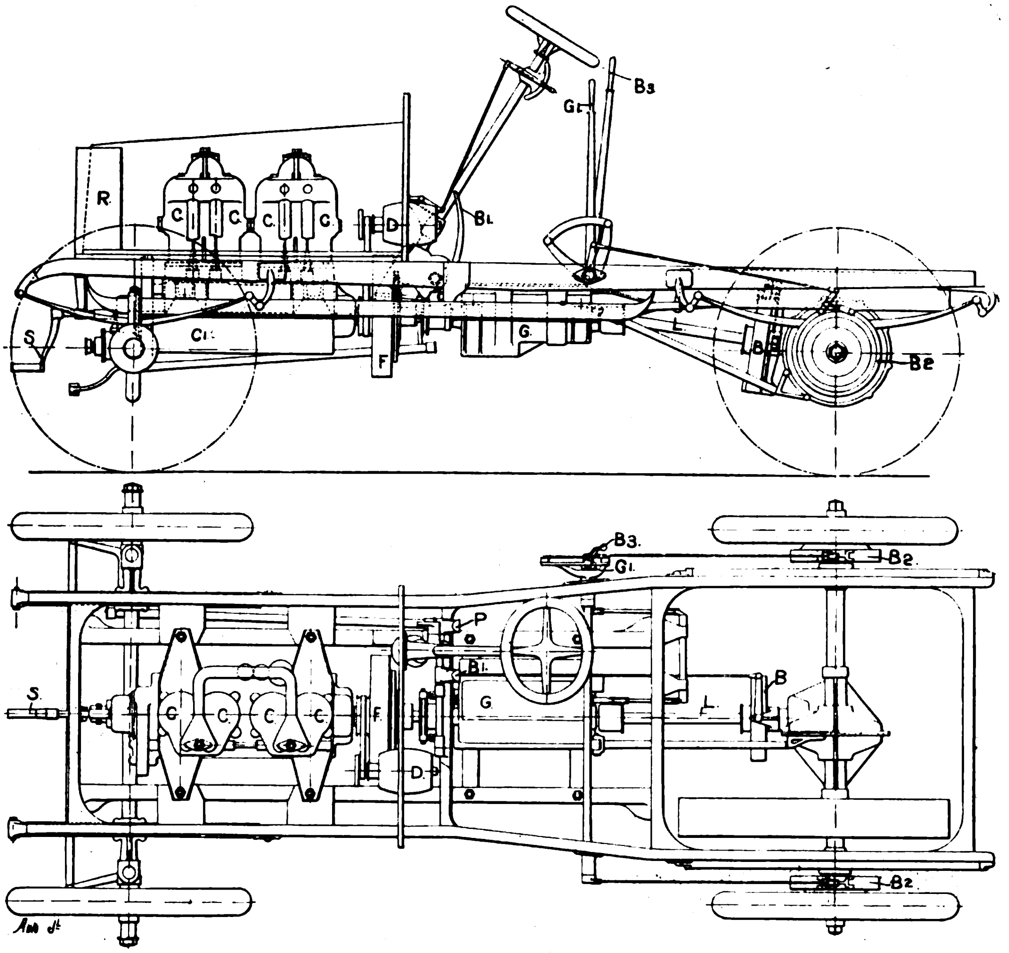
FIG. 1.—The 10-h.p. Thornycroft Petrol Car.

WE have already briefly noticed (pages 113 and 146) the new 10 and 20-h.p. cars just placed upon the market by this well-known firm, and now have pleasure in presenting our readers with a more complete description of them. The Messrs. Thornycroft confined their attention, up to about a year ago, almost entirely to the development of the heavy-load steam lurry for commercial purposes, and it is only just to say that their skill, perseverance, and enterprise proved of the very utmost importance in this great branch of the automobile industry, and that they well deserve the signal success which has been attained by them in this direction. With their order lists so full that even their large and well-equipped factory at Basingstoke is scarcely able to keep abreast of the work undertaken, it might have been thought that they would be content to rest for a time on their laurels, and reap the reward of their past labours. But it is characteristic of this firm never to sit still; and, therefore, it might have been with certainty predicted that, having conclusively established the heavy steam wagon as a commercial success, they would unfailingly turn their attention to the type of petrol pleasure car to which public notice is now so keenly directed. Preliminary designs were prepared just about nine months ago, and the problem of producing a thoroughly well-built and reliable type of car was seriously taken in hand. In considering the very large number of points that must necessarily be raised under these circumstances, the designers have persistently kept before them the cardinal considerations of simplicity, reliability, and accessibility; simplicity —for it is a truism that, be it ever so well designed and constructed, any combination of mechanism is liable to derangement, and therefore the fewer the parts the less, in the same proportion, is the probability of trouble; reliability — partly a result of simpleness of arrangement, partly obtained by careful selection of materials, and skilful workmanship; and accessibility—for "the best laid plans of mice and men gang aft agley," and facility of access to a deranged part of the mechanism is too obvious an advantage to need emphasising.

As a consequence of the foregoing, one is not surprised to find on examination of the actual 10-h.p. car shown at the Crystal Palace, that its most prominent quality is its absence of complication, and puzzled observers were frequently overheard to remark how little there was of it, thus unconsciously paying its designers a complimentary tribute.

Descending now to particulars, Fig. 1 shows a general view of the 10-h.p. tonneau, modestly finished in dark green, and externally resembling the normal up-to-date 4-seated type at present in vogue; bodies of the double phaeton, or other type, can of course be fitted to the chassis if so desired. The arrangement of the mechanism is also normal. In the extreme front is the radiator, which may be either of the gilled or honeycomb type, the motor being so arranged that, in the latter case, an air-circulating fan may be driven from a pulley on the motor shaft. The motor itself is carried on a steel frame suspended from the main frame proper, and is of the two-cylinder, vertical type, the cylinders forming one casting, and being water-cooled about half-way down from the combustion chamber end. The diameter of each cylinder is 4 inches, and the stroke of the pistons is 4⅜ inches; the crank-shaft is of special steel, in one piece, with cranks set at 180 degrees, and no central bearing: the pistons have each four cast-iron spring rings, and are of considerable length, thus ensuring absence of leakage during the compression and working strokes. The connecting rods are of cast steel of double-tee section, bushed with phosphor bronze, the big ends being adjustable; the big-end cap-brass is about ⅜-inch narrower than the corresponding bottom brass, facilitating the lubrication of the crank pins from the crank-chamber oil-bath. The crank-chamber is of aluminium, with removable bottom cover; an important feature of the design is that the removal of this base leaves the crank-shaft unaffected, its bearings being quite independent and supported wholly by the upper half of the casting; this is a very great advantage in practice, and is almost unique in English-built cars. The crank-shaft is prolonged forward, and carries the governor and a spur wheel operating the circulating water pumps: it terminates finally in a spring-clutch connection for the starting handle.

At the rear end the shaft is coned and keyed to receive the flywheel-clutch, transmitting the power through the gear box to the rear axle and wheels. The induction valves are placed vertically above the exhaust valves, the latter only being mechanically operated; the sparking plugs are screwed into the cylinder casting midway between these valves. The design admits of positively actuated inlet-valves being fitted if so desired, but the advantages conferred by this arrangement are considered by the makers to be entirely conjectural, further experience being deemed needful before a definite opinion is formed; meantime the makers have preferred to adhere to the more usual practice. The inlet-valve seatings are both retained in position by a single stud and nut, the latter bearing on a cross-piece whose extremities are in pressure contact with the two branches of a breeched aluminium induction pipe; the ends of these branches are provided with narrow collars bearing upon the inlet-valve seatings; the arrangement is clearly shown in Fig. 3, which is a plan of the 20-h.p. chassis. By removing the nut and crosspiece, and hinging the breeched pipe back, the pair of inlet-valves can be lifted out, and the exhaust valves are thus also exposed to view, and can be thoroughly examined, ground in, or renewed with ease. We notice that Messrs. Charron, Girardot et Voigt have adopted a very similar arrangement in one of their cars, and that the 1903 James and Browne vehicles have such a device fitted. The half-speed shaft is completely encased, and is driven from the crank-shaft in the usual manner; a hard steel roller, ⅞-inch diameter, is introduced between the cam and the end of exhaust valve stem to diminish the friction and avoid side-thrust on the latter; a roller is thought preferable to a ball in this position, as it gives a line-contact with the driving-cam. The exhaust-valve-stem guides are of bronze, and are very long, thus giving excellent support and bearing surface, and preventing leakage of oil.



FIGS. 2 and 3.—Side Elevation and Plan of the 20-h.p. Thornycroft Petrol Car.

B, Band brake operated by pedal, B^1. B^2, Side brakes operated by side lever, B^3. C, Cylinders. C^1, Crank-chamber. F, Fly-wheel. G, Gear-box. G^1, Change-speed lever. D, Dynamo. L, Longitudinal shaft. P, Clutch pedal. R, Radiator. S, Starting handle.

The governor is of the centrifugal type, carried on the crank-shaft and is wholly enclosed in an aluminium case; it regulates the speed of the motor by throttling the mixture; the throttle valve is so arranged that, when the speed of the motor increases, an auxiliary air-supply is automatically opened, thus preserving an approximately constant

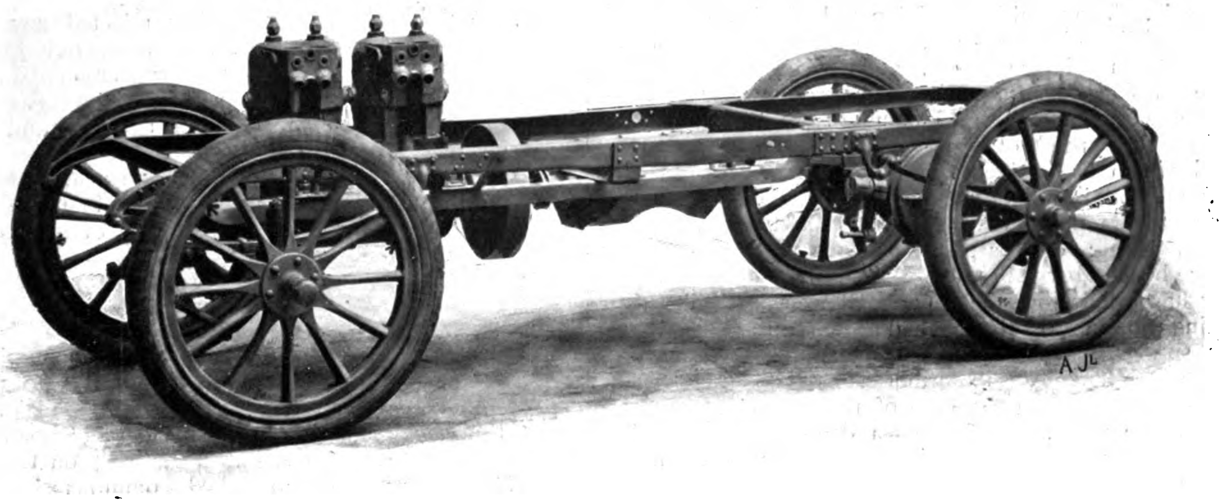


FIG. 4.—The Thornycroft 20-h.p. Chassis.

richness of the mixture under all circumstances. The governor can be put out of action in the usual manner when it is desired to "accelerate." The carburettor is of the constant-level float-feed spray type, carefully designed in every detail; the spraying-nozzle is especially accessible for examination or cleansing. The ignition is of the high-tension electric type, the current being supplied by a battery or a dynamo. When a dynamo is fitted, the battery is employed for starting and it is automatically cut out, and the dynamo switched on instead, as soon as the engine attains a certain speed; this is accomplished by a special device, the invention, we understand, of Sir John Thornycroft. A centrifugal governor on the dynamo spindle controls a friction clutch, arranged between the spindle and the dynamo-pulley; this prevents armature of the dynamo from being driven at too great a speed.

The cooling water is circulated around the cylinders and through the radiator by a simple, silent, rotary pump, gear-driven from the crank-shaft.

The main clutch is of the internal, expanding, friction type, with cylindrical pressure-surfaces; the friction pads, two in number, are leather or fibre covered, and are maintained in pressure-contact with the flywheel by a powerful helical spring carried about the main driving-shaft, and acting through a special balancing device which ensures that the friction pads shall be pressed outwards equally against the internal surface of the flywheel. The centrifugal tendency of the friction pads themselves is compensated by a pair of adjusted weights, allowing the clutch to be withdrawn by a light pressure of the foot on the clutch pedal, whatever may be the speed of the engine. The design is also such that the clutch-spring does not put any end thrust on any revolving parts under normal running conditions.

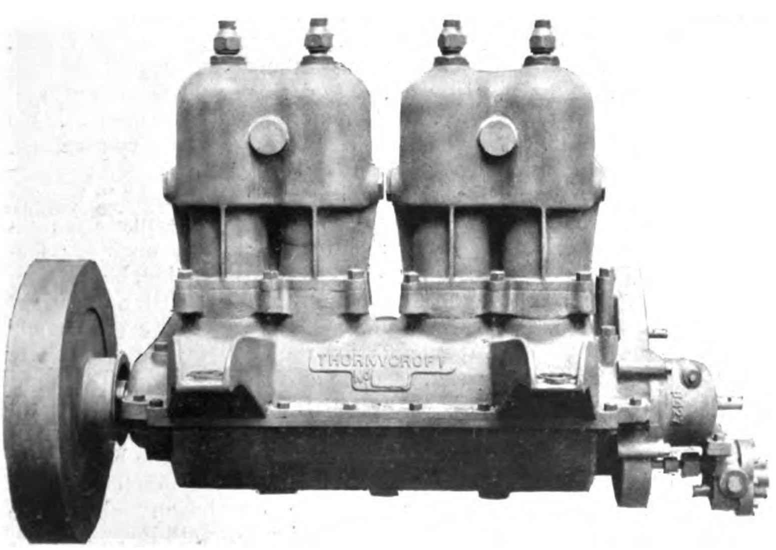


FIG. 5.—The Thornycroft 20-h.p. Petrol Engine.

The gear-box is fixed to the underframe, and is located about the centre of the main frame. It is made of aluminium, and is very compact. The upper of the two halves is fitted with a removable lid for permitting ready examination of the gear. A feature of the design is that the striking-bar passes through the upper part of the box, thus obviating the loss of oil which occurs in the frequent cases where it is placed near or at the bottom of the box. Three forward and one reverse speeds are provided, either of which can be alternatively brought into use by a single hand lever on the right of the driver. When the lever is moved to its extreme rearward position the car runs "astern," and when brought forward, the lowest, second, and highest gears are successively engaged; a neutral position lies between the reverse and low forward speed. On the highest speed the drive is direct through from the crank-shaft to the rear-axle, the counter-shaft with its gear-wheels in the gear-box then standing idle; the efficiency of this drive is thus unusually high, and it is almost entirely noiseless. The gear-wheels are of large diameter, ample pitch, and large face-width, to ensure durability; the teeth are all machine-cut on steel blanks, and oil-tempered. The drive is transmitted from the gear-box by a longitudinal shaft, having specially-designed, large surface, oil-retaining and enclosed universal joints at each end. It passes to the differential gear-case on the rear axle. The usual bevel pinion and wheel are enclosed in the differential gear-case. The bevel pinion is of steel with machine-cut teeth, and provision is made in the enclosing case for pinions of several different sizes to be mounted at the option of the owner, thus suiting the speed of car to individual tastes. The bevel pinion is provided with bearings both behind and in front, and is not over-hung, as is too often the case in general practice. The rear axle is in two parts and is tube-enclosed; each part is carried in two long phosphor-bronze bushes borne in the enclosing tubes and automatically lubricated from the differential gear-box. The supporting tubes are rigidly attached at their outer ends to the rear springs, and at their inner ends to the differential gear-case. The axle is further stiffened by a pair of steel stays connecting the base of the gear case with the ends of the tubes, thus forming a deep truss and giving an exceedingly strong construction. It will be noted that the rotating parts of the back axle are, by these trussed tubes, relieved from all bending stress. The rear road wheels are keyed on to the outer ends of these rotating parts. The car is carried on semi-elliptic plate springs; the front springs have a span of 30 inches, and are fixed at the front end and free at the other end; the rear springs are of 36 inches span, and free at both ends. A single radius rod connects the rear axle with the gear box. The wheels are of the artillery type, 12-spoked, with metal naves, oak spokes, and ash felloes; the tyres are Clipper-Michelin; all wheels are of the same diameter, and tyres interchangeable. The standard size of the tyres is 800 mm. by 85 mm. The front axle is of bent steel tube, terminated in steel castings, carrying the hardened heads for the stub-axles, on which the front wheels revolve. The steering is effected in the usual manner, and an irreversible worm and sector is employed.

The main frame is of high-grade steel of bent channel section, bellied towards the central part, and of very stiff construction, with gusset-plates at the junctions of the transverse pieces with the longitudinal members.

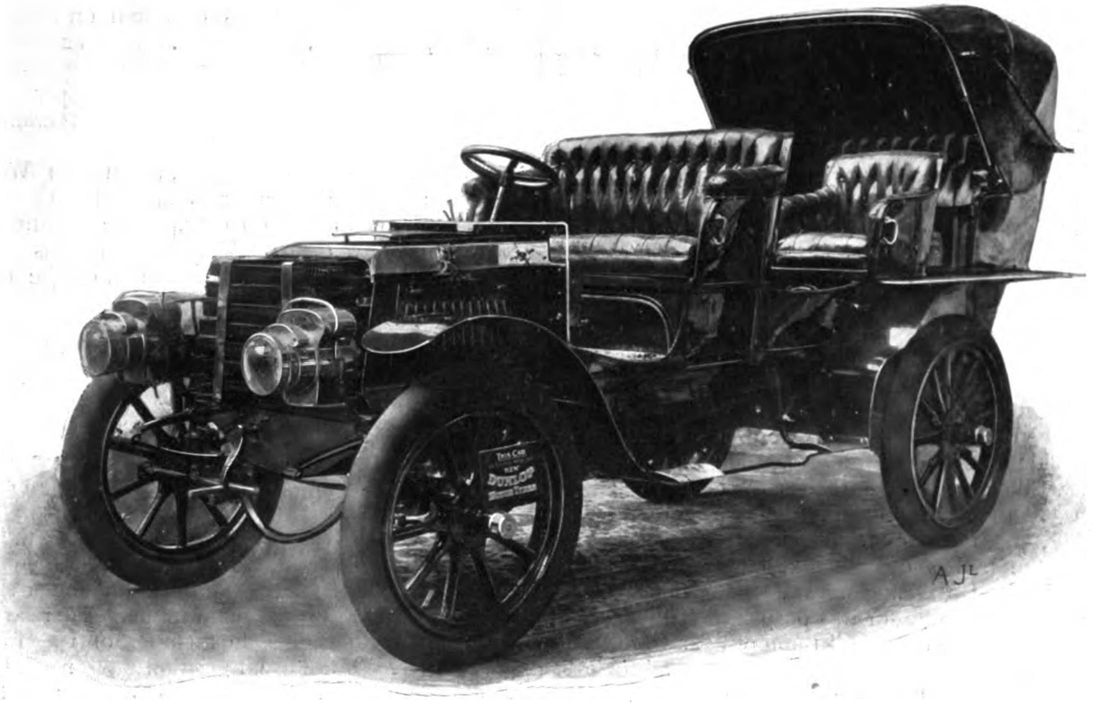
The 20-h.p. chassis is illustrated in side elevation and plan in Figs. 2 and 3. Fig. 4 gives an external view of the 4-cylinder motor; this is of the same general design as the 10-h.p. motor, the cylinders being 4 inches in diameter by 4⅜ inches stroke. The description given above of the 10-h.p. car applies also to the 20-h.p. vehicle, excepting that the underframe and gears are, of course, considerably stronger, and that the wheels are somewhat larger, with "extra fort" Clipper-Michelin tyres, 870 mm. by 90 mm. The arrangement of levers and pedals for controlling the cars does not differ materially from ordinary practice. The steering-wheel is 14 inches in diameter and is mounted on an inclined steering pillar carrying the ignition and governor-controlling levers. The change-speed hand-lever and the side-brake lever, by which the hub-brakes are simultaneously applied to each driving wheel, are placed to the right of the driver. The main clutch is controlled by one foot-pedal, and a second pedal applies a double-acting band-brake on the longitudinal shaft. In Figs. 2 and 3 the dynamo will be noticed; it is belt-driven from the crank-shaft.

The Thornycroft cars are throughout (excepting tyres and electrical details) manufactured by the firm at their extensive Basingstoke works, and we are glad to congratulate them on having added another well-designed and well-made car to those of exclusively English construction. The designers have, we think wisely, consistently rejected any undue refinements or complications, and have devoted their energies and experience towards the production of a simple, light, high-class, and reliable type of vehicle. The weight of the 10-h p. car complete is about 13 cwts., and of the 20-h.p. vehicle about 15 cwts.

The future performances of these cars will be followed with very great interest by automobilists in this country, and we wish the Thornycroft Company every success in their new enterprise.

IN several directions movements on a somewhat extensive scale are being made by syndicates to provide motor omnibuses for London. In the majority of cases the vehicles provided are considerably smaller than the regular horse-drawn omnibus running on the roads, the Milnes-Daimler two-decked omnibus being the nearest approach, outside the large Thornycroft steam omnibus, to the regulation omnibus of the London Road Car and General Omnibus Companies. It is therefore with the greatest disappointment that we find the old-established omnibus companies still holding aloof from any real efforts to take up this matter seriously. With their existing organisation they should be able to carry out a thorough test on a large scale at a minimum of expense, and if well planned the suggestions that it cannot be made to pay we feel convinced would not be borne out. At the meeting of the Associated Omnibus Company last Monday, Mr. S. Crews, the chairman, announced that although the directors had been watching carefully the experiments made with various motor cars, they were of opinion that as yet no motor had been brought forward that could successfully compete with the horse-drawn omnibus. The actual cost of petrol was small, but the upkeep was very great, and the expense of maintaining motors would be considerably more than the cost of running omnibuses with horses, even at the present high price of forage. If the Company were to place a number of motor cars on the road, these cars would have to go into "dock" about once a week to be thoroughly overhauled if they wished to keep them in a perfect state of repair. This would necessitate, he said, for 200 cars an additional supply of about 30 cars to take the place of those under repair, and the expense therefore would be enormous and prohibitive. Of course, later on, he said, this might be altered, and when that time arrived the directors would be to the fore. No doubt Mr. Crews has studied this question very carefully, and although his suggestion of 30 extra cars being necessary to keep a regular service going may be somewhat beyond the mark, at the same time the question of regular attention and overhauling every week is the crux of the whole question. So far this has never, to our knowledge, been done, and we are firmly of the opinion that once such a service is instituted, and carried out in such a way that every vehicle passes through the hands of the repairing shop regularly about once per week, that the cost of upkeep will be found to have been vastly exaggerated, and that such proper and regular attention to the machinery will render the life of each vehicle far greater than the most sanguine have so far dared to suggest. We should certainly be much surprised if Mr. Crews' rather remarkable conclusions about the costliness of upkeep of the motor 'buses could be supported. He has, however, produced no data of any kind.

THE AUTOMOBILE SHOW AT THE CRYSTAL PALACE.—PART II.



One of the latest Panhard and Levassor Cars.—Shown by Mr. Harvey du Cros.

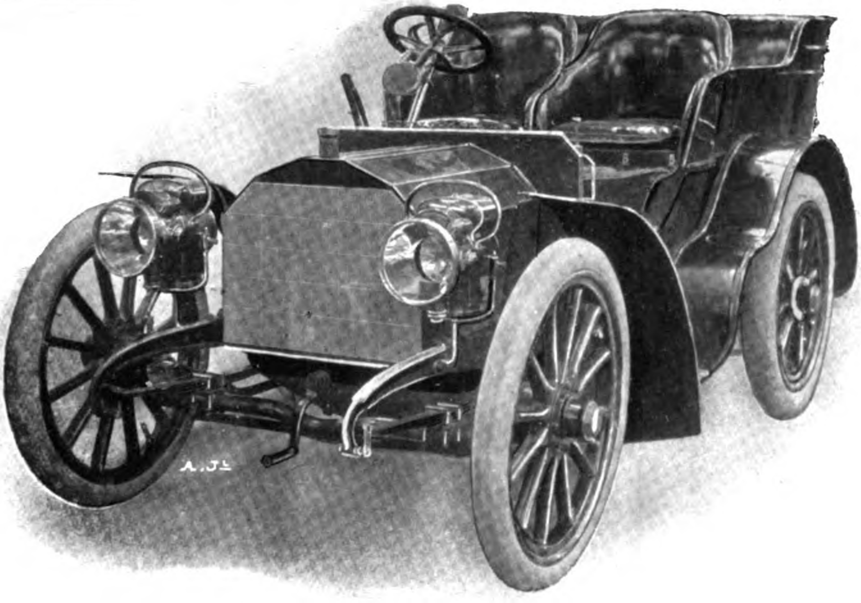
Brief mention was made last week of the new 20-h.p. Belsize car shown by Messrs. Marshall and Co., of Manchester, the chief features of which are that a 3-cylinder motor is employed, and that a single central chain connects the change-speed gear with the live-rear-axle. The engine is placed in the usual position with its crank-shaft lying longitudinally. The change gear is similar to that on their other cars, but a small bevel wheel on the rear end of the second-motion-shaft meshes with a corresponding wheel on a short cross shaft, from which the power is taken by a single chain to the differential gear on the live-rear-axle. This short shaft is mounted in roller bearings, and roller bearings are also employed on the back axle. The chain is exceptionally large, and is enclosed in a case formed partly of aluminium and partly of leather. The levers for operating the gear and the side brakes are arranged near the steering column instead of being placed outside. The car weighs 18 cwt. unloaded, and the track is 4 feet 8 inches. In their 12-h.p. vehicles, which we have previously referred to, the front ends of the rear springs are fixed to sleeves, which are free to slide upon horizontal pins, the two ends of which are fixed to the main frame. These springs are not clipped to the axles at their centres, but a greater length of spring projects forward than backward. The twin-cylinder engine has a built-up crank-shaft, in which four flywheels are enclosed in the crank chamber, and there is a middle bearing for the shaft.

The Autocar Construction Company showed samples of the Hermes cars, which are manufactured by them in their Manchester works. Their entire construction differs considerably from ordinary practice. The main frame is built of very heavy channel steel, and the cross members, which are tubular, carry the engine and the change-speed gear almost centrally between the front and rear axles. The engine is of the horizontal type, with cylinders arranged almost but not quite opposite, in front and behind the crank chamber. It is placed to the left of the frame, the crank-shaft lying transversely, and the flywheel being almost in the centre of the vehicle. A friction clutch of the cone type is formed inside the flywheel, and connects the crank-shaft through a flexible coupling with the first-motion shaft of the change-speed gear. The gear-box lies near the right side of the frame, and encloses gear wheels on the first and second-motion shaft for giving four speeds and a reverse. The two shafts are in the same horizontal plane, and the gear wheels are at all times in mesh with one another. The wheels on the first-motion shaft are rigid with it, those on the second-motion shaft are mounted freely upon that shaft, but the shaft is so shaped with slots cut in its surface that either of the wheels can be made rigid with it by sliding it longitudinally through them. For this purpose the hubs of the wheels are fitted with spring catches, and the catch in either wheel will engage with the slots in the shaft when they are brought opposite to it. The differential gear is mounted on the inner end of the second-motion shaft, and is not enclosed in the gear box. The shell of it is driven by the second-motion shaft, and each of the differential members carries a sprocket wheel, and is free to revolve independently. These two sprockets lie on either side of a brake drum on the shell, and a chain passes from each to the two halves of a live-rear-axle. The chains are enclosed about the axle, and light casings surround them for a considerable part of their length towards the differential. The object of transferring the differential from the axle to the second-motion shaft is to be able to reduce its size, and the strains imposed upon it, by allowing it to run at a higher speed. A foot pedal applies the brake on the differential, and a hand lever applies double-acting brakes to the hubs of each rear wheel. These side brakes are compensated through a steel cable passing across at the back of the main frame. A safety pawl is arranged so that it can be brought into contact with a ratchet wheel in the one brake drum, for preventing the car from running backwards down hill; the pawl can be withdrawn without stopping the car. The engine is fitted with atmospheric inlet valves above the cylinder, and exhaust valves beneath. The ignition is of the high tension type, and the plugs have both conductors insulated. An automatic governor regulates the speed of the engine by a throttle valve. The cranks are arranged opposite one another, and the cylinders fire alternately; separate exhaust pipes are taken to the back of the car, where the gases are led through two exhaust boxes arranged in series. The Hermes cars are fitted with either 15, 18, or 24-h.p. engines, and are unusually wide. The bodies accommodate three people side by side on each seat. The entire vehicle is of large size, being 11 feet 2 inches over all in length and 6 feet 1 inch in width. The wheel base is 7 feet 6 inches, and the track 5 feet 1 inch. The cars are so made that the bodies can be slid backwards so as to expose the whole of the mechanism, small rollers being mounted in the main frame for this purpose. The steering pillar passes through the dash and the foot pedals are fixed to it; there is thus no necessity for disturbing the footboards in front of the driver's seat when removing the body. The tanks containing water, petrol, and lubricating oil are fitted beneath the bonnet in front, and there is also sufficient room beneath it for storing all tools and other necessary articles. Another unusual feature on these cars is that sight-feed lubricators are placed so that the glasses lie across a square hole in the centre of the dash in such a way that an electric lamp inside the bonnet allows them to be seen clearly at night.

Messrs. Pritchetts and Gold showed a new petrol car which they are putting upon the market. It is fitted with a 14-h.p. Blake motor. The motor itself was described by us, with illustrations, in our issue of May 24th last. The main frame is of tubular construction, and the general arrangement of parts is similar to that of other makes in which the power is transmitted from a countershaft to the rear wheels by side chains. The main clutch is of the internal cone type, and is operated by the foot pedal through a double lever system which renders it very sensitive. Flexible couplings are provided between the clutch and the gear-box and in each half of the countershaft. Three speeds and a reverse are provided, and the reversing gear is brought into operation by a separate lever. The engine and gear are fixed to an underframe, which is also tubular, and an additional bearing is provided on the longer portion of the countershaft outside the brake drum, which is operated by the foot pedal. The vehicle appeared to be well constructed, and of good design. Special precautions have been taken to ensure perfect brazed joints in the frame. The car has a tonneau body seating four persons. The artillery wheels are shod with Michelin or Continental pneumatic tyres, 750 mm. by 85 mm. The ignition system employed is interesting, a single coil being employed for all four cylinders, and the commutator being so constructed as to commute the high tension current to each of the four plugs in turn. The commutator also establishes the primary circuit to the coil at the desired time, and does so after the secondary circuit has been completed, thus avoiding sparking.

A 12-h.p. Korte car was exhibited on the stall of Rice and Co., Limited, of Leeds. It has a four-seated tonneau body, and is apparently of strong construction. The engine is of the twin-cylinder vertical type, and is fixed in front beneath the bonnet, its crank-shaft lying transversely across the car. The main clutch is fitted on the left end of the crank-shaft, and, as in the Wolseley and Brooke models, the power is taken by a Renold silent chain to the change-speed gear. The engine has atmospheric inlet valves and half-compression cams for facilitating starting; the commutator is mounted on the dash, and is driven by a chain and bevel gearing. The change-speed gear provides four forward speeds and a reverse, and the power is taken from it to the rear wheels by side chains.

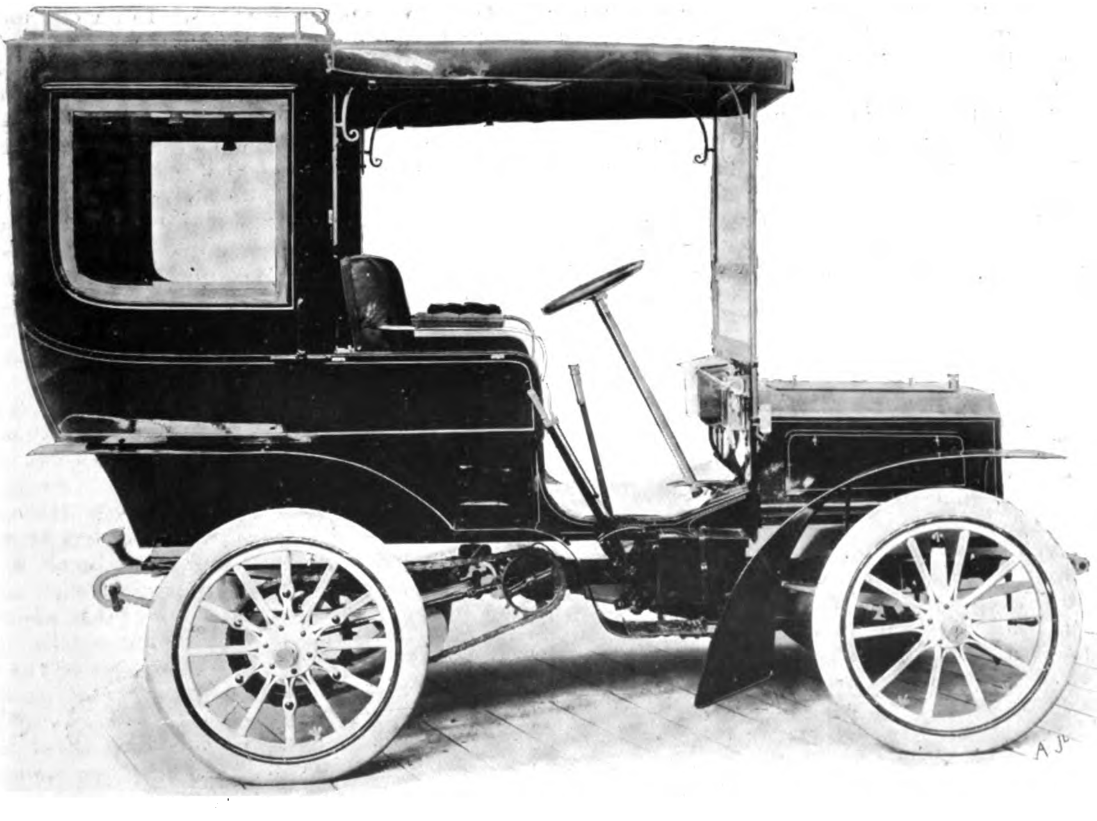
The Eagle Engineering and Motor Company, of Altrincham, are building small petrol cars which possess several novel features, and are also about to construct vehicles on somewhat similar lines, with engines of up to 24-h.p. With single cylinders the motors give 8 or 9-h.p., and the 12-h.p. pattern has twin cylinders. The main frame is of tubular construction and is suspended above the axles upon semi-elliptic springs, the inner ends of which are carried upon the ends of inverted springs of a similar shape, which are fixed centrally to the main frame. There are thus three springs beneath each side member of the frame. The motor is fixed in the usual position in front and the power is transmitted to a live-rear-axle, through a longitudinal and universally-jointed shaft. The change-speed gear is of special construction and of ingenious design. It is of the epicyclic type and provides two forward speeds and a reverse. Only one set of planet wheels is employed for giving the hill climbing and reversing gears, and the entire mechanism revolves as one piece in self-aligning spherical bearings on the top speed. The high and low gear are operated by one lever, the reverse by another, and a third side lever applies compensated band brakes on the rear wheels. Natural circulation is relied upon for cooling the engine, and a multitubular radiator built up of large square tubes, somewhat on Mercedes lines, is fitted in front. The petrol tank forms the dashboard, and on the 9-h.p. vehicle has a capacity of five gallons. The carburettor employed is of the Company's wick type which has been previously described by us in connection with the Eagle tandems (Vol. VI., page 237). A similar form of steering wheel, having only one arm connecting the rim with the hub, is also employed on the cars. The Eagle tandems have been improved in several respects this year, and several of them were shown, including one specially built to order, in which both seats have been lowered considerably, and the size of the wheels increased; it has a 9-h.p. De Dion motor. In these speedy little machines the tubular framework is constructed of straight tubes, which are stayed by tie-rods beneath; the power is taken from the engine to a countershaft by a silent chain, and from the countershaft by either of two chains on either side of the driving wheel. The countershaft is mounted in plain bearings and carries two clutches for bringing either of the two alternative gears into operation. The clutches are of the cone type, and the male members are forced inward by the action of two pivoted lever arms, which are raised by a sliding cone on the countershaft. The clutches are so made that they can be very easily adjusted to take up any wear,



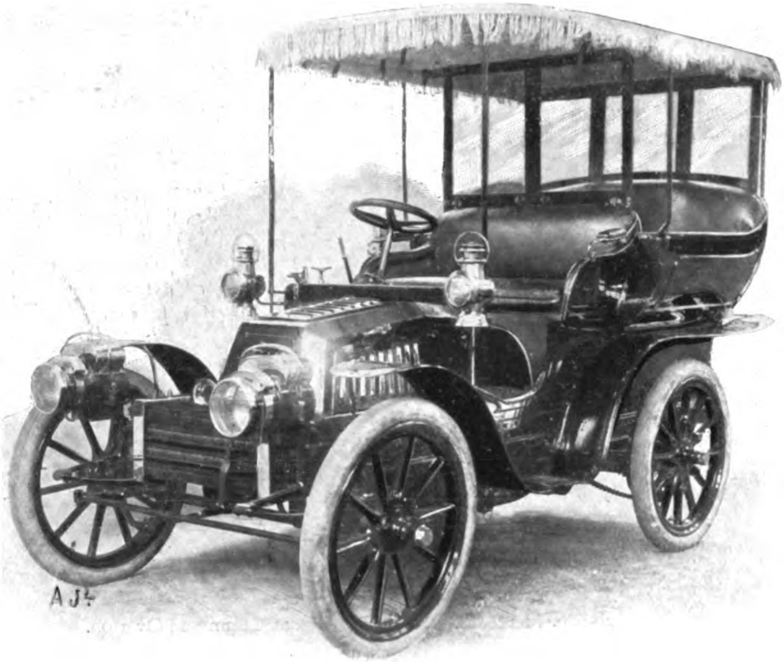
20-h.p. Mercedes.—Shown by Messrs. Mann and Overton.

and to suit requirements. These tandems are of very strong construction and are well finished; the wheels are provided with ⅜-inch ball bearings, the front axles are stronger than formerly, and the water is circulated through the jacket and radiator by a belt-driven pump.

The Swift Company made an excellent show with the special voiturettes made by them. We gave an illustrated description of these in our issue of October 18th last, and it will be remembered that at that time two forward speeds but no "reverse" were fitted. The Company have now added an ingenious reversing gear without materially altering the general construction. The two forward speeds are obtained in precisely the same manner as before, but the shaft, which hitherto served only for starting the



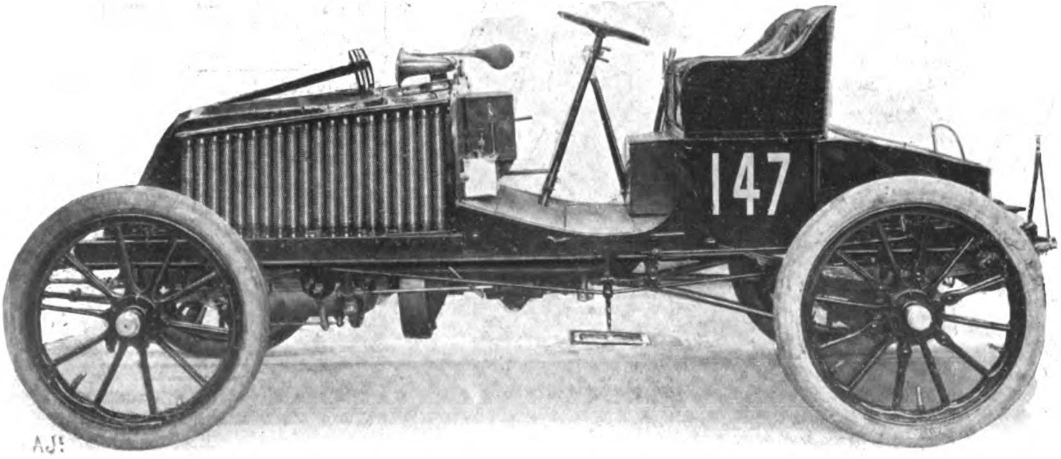
Gladiator 4-cylinder 10-h.p. Brougham.



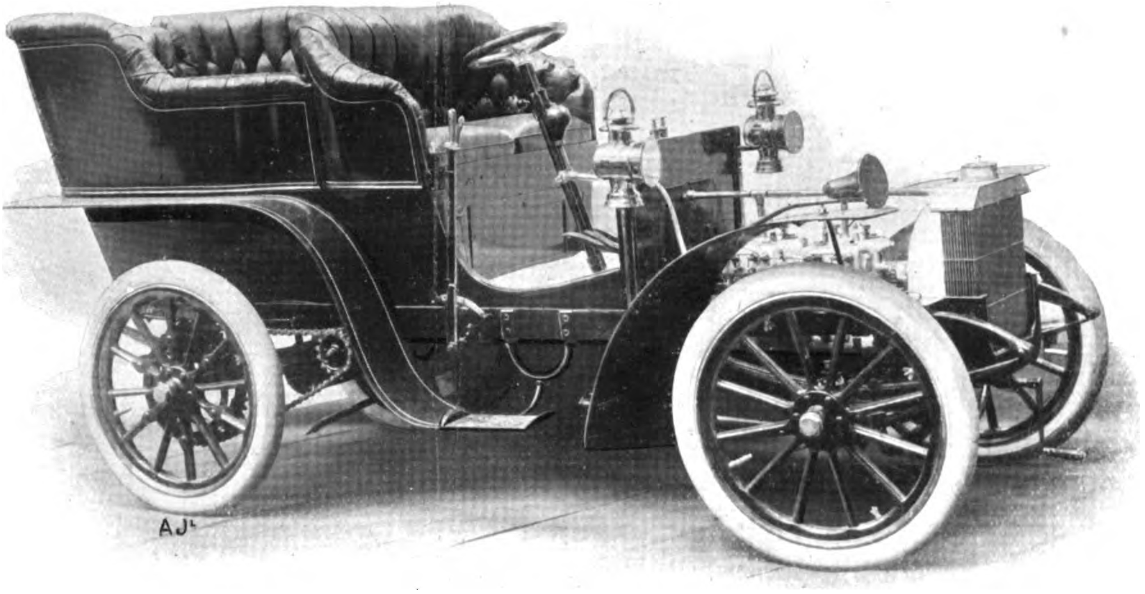
Five-seated 12-h.p. Bardon Limousine.—Shown by the Auto Carriage Company.

engine from the back of the car, is now utilised as a lay shaft for transmitting the power to a third bevel wheel in the gear case. This third wheel is mounted upon a shaft arranged radially at the back of the gear case, and it meshes with the same toothed wheel which is used for the low speed. A pair of spur wheels connect its shaft with the lay shaft, and an additional jaw clutch is used for rendering the new bevel wheel rigid with its shaft. Since this wheel is mounted on the opposite side of the back axle to the other wheels, it drives the axle in the opposite direction. Owing to the fact that ratchet wheels with pawls are employed instead of a differential gear, and that these devices are mounted inside the brake-drums of each driving wheel, it is necessary that one of the road wheels should be rigid with the back axle to allow the axle to drive it backwards. This provision is made, and the jaw clutch which locks the wheel to the axle is simultaneously operated by a side hand-lever which brings the reversing bevel wheel into use. The change-speed lever is carried upon the steering pillar as before.

The Pick Motor Company make two distinct types of vehicle, and in two different sizes. In the one form a belt is used to transmit the power from the engine to a countershaft carried behind the live-rear-axle, and in the other the power is transmitted by chains from the crank-shaft to a gear-box, and from it to the rear-axle. The engines employed have two horizontal cylinders, arranged facing one another, and bolted to the crank-chamber. The two cylinders are not in line with one another; the one projects forward and the other backward from the chamber. The engines are of 6 or 10-h.p., and are identical except in size in the four models made. In the belt-driven machine

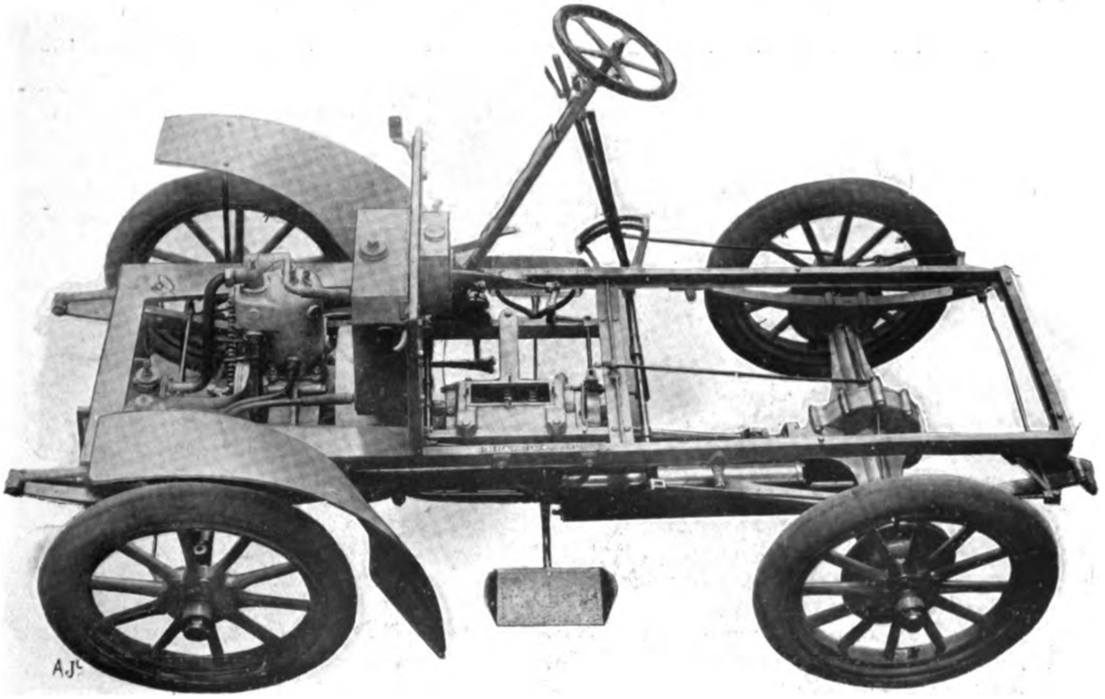


Renault Racer.—Winner of the Paris-Vienna Race.—Shown by the Roadway Autocar Company.

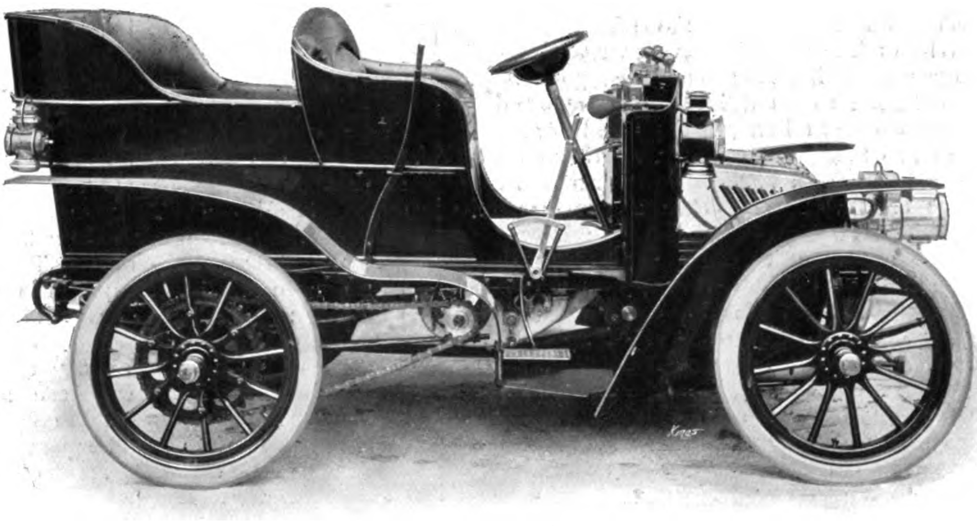


One of the 4-cylinder Beaufort Cars, with bonnet removed.

the fly-wheel is placed close to the crank-chamber with a wide pulley drum outside it, and the end of the crank-shaft is supported in a bearing carried by a bridge, which loops round underneath the flywheel. Fast and loose pulleys are mounted on the countershaft behind the axle, and the shaft carries spur-wheels which engage in corresponding wheels on the shell of the differential. Either of two forward speeds can be obtained by jaw-clutches, which render either of the pinions rigid with the countershaft, and a reverse is provided by similarly clutching to the countershaft a sprocket wheel from which a chain passes to the differential. Radiating tubes are arranged round the base of the bonnet, and a circulating pump is driven by the camshaft, which lies across the top of the engine. The usual brakes are fitted, but are operated by means of a cam which, when rotated about its axis, tightens the two halves of the brake-bands. In the gear-driven vehicles a friction clutch is mounted on the crank-shaft inside the fly-



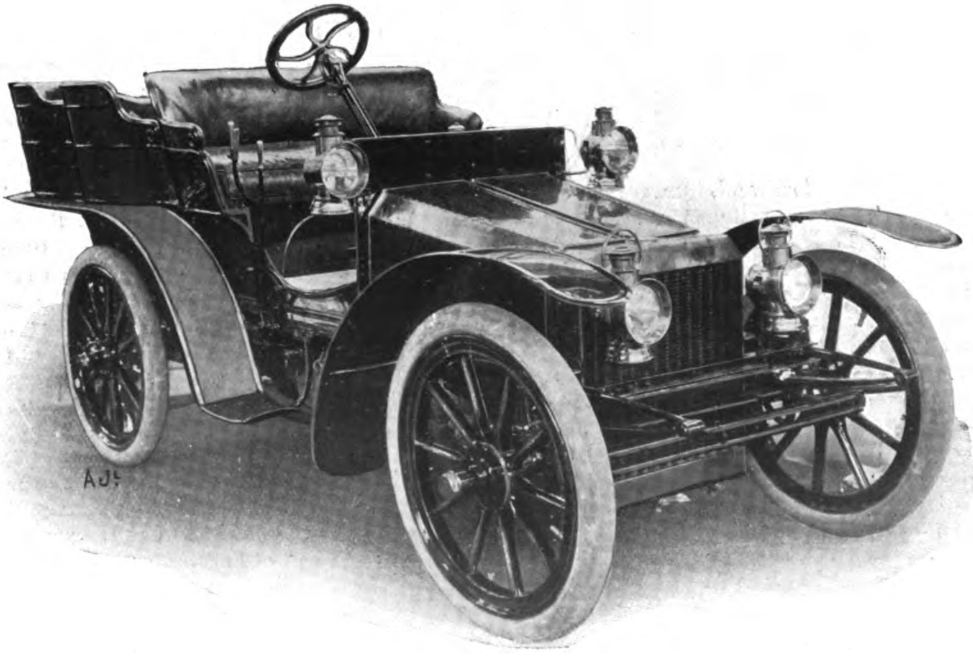
Chassis of a Beaufort single-cylinder Car.



A Standard 12-h.p. Brooke Car.

wheel, and a Renold silent chain leads from it to the first-motion shaft of the change-speed gear. The gear-box is mounted on a small tubular underframe, and provides three forward speeds and a reverse. The second-motion shaft lies immediately behind the first-motion shaft, and carries on its one end a brake-drum, and on its other projecting end a sprocket, from which a chain passes to the rear axle. In the 6-h.p. vehicle a separate lever operates the reverse, and on the larger vehicle it is brought into play by the same horizontal lever on the steering pillar which operates the forward speeds.

Other English makers showing small voiturettes of their own manufacture were the General Motor Car Company, Chas. Peacock and Co., and Mr. B. E. Dickenson. These three makers have specially aimed at producing small cars at as low a price as possible. We mentioned the light tradesman's van of the General Motor Car Company's make in our description of the last National Exhibition, and on this occasion they also had similar vehicles fitted with two and three speed gears, ranging in price from 100 to 150 guineas. Mr. Peacock showed his "Carpeviam" model, in which the propelling mechanism is in general respects similar to that employed on the Century and Eagle tandems, but the framework and construction generally lack the good design and workmanship of those machines. The Dickenson "Morette" resembles a tricycle with a front steering wheel, in which a light basket body is carried upon springs above the rear axle, and is connected to the tubular frame in



The James and Browne 4-cylinder 18-h.p. Car.

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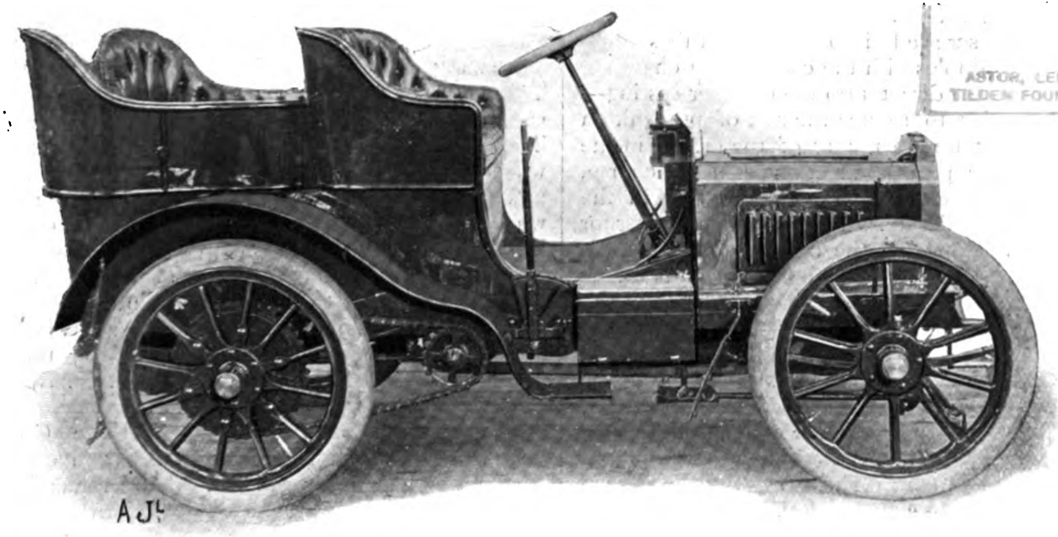
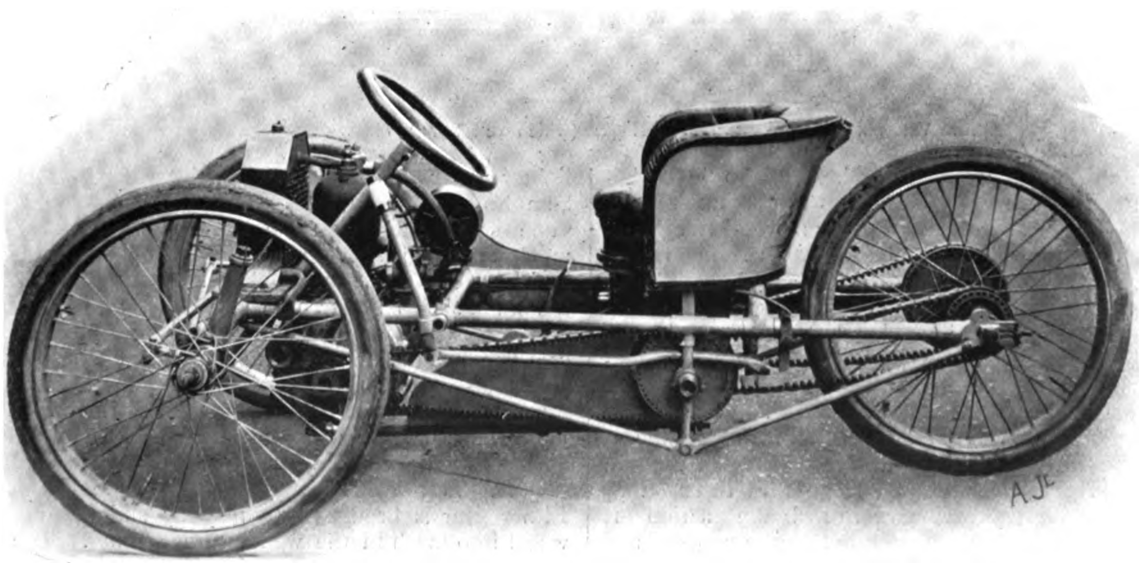


One of the Siddeley Tonneaus.

front. It is driven by a small "two-stroke" motor which is mounted above the front wheel, and has a friction drum on its shaft, which can be brought into contact with the tyre—driving it by friction. A larger machine, to carry two, is also made, and a chain-drive is substituted for the friction method when desired.

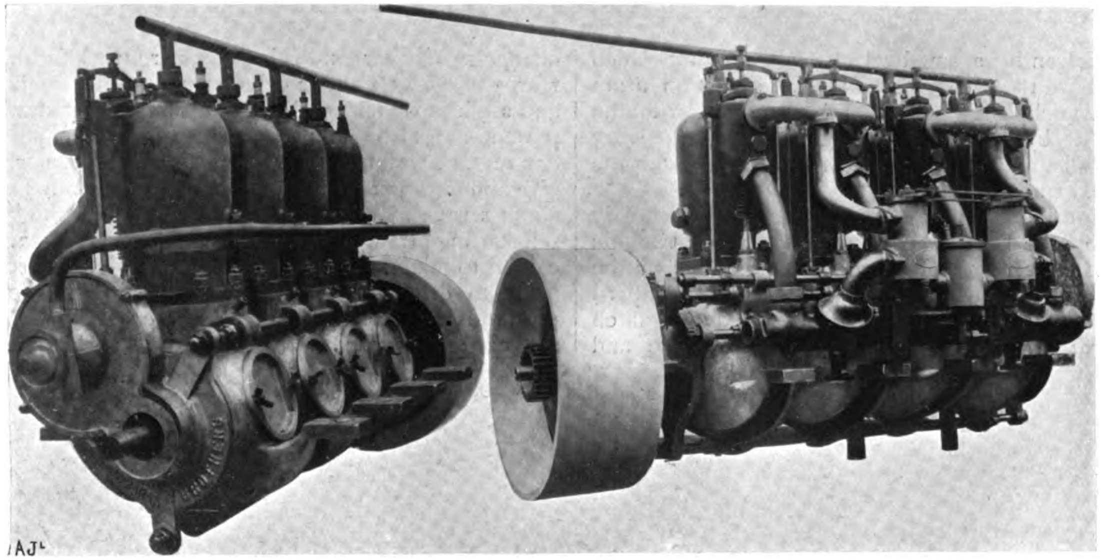
Amongst Continental petrol cars mentioned only briefly by us last week, the Deschamps cars shown by the Graphic Motor and Engineering Company of Peckham should be mentioned. In general respects they resemble Panhard designs. The main frames are made of wood and flitch plates, a separate underframe supports the engine and change-speed gear, and side chains are used for driving the rear wheels. Of the 2-cylinder pattern there is a 7-h.p. and a 9-h.p. vehicle, and 4-cylinder models of double these powers are also supplied. The normal engine speed is 850 revs. per minute, and the maximum speed, at which they give about 30 per cent. more than their nominal power, is about 1,100 revs. The engines are fitted with the "Creese" self-starting arrangement, by which an electric spark can be caused to take place in which ever cylinder is necessary in order to drive the engine in a forward direction. The push-rods which act upon the exhaust valve stems are carried in hardened steel guides, which are fixed



The Eagle Racing Tandem. This machine secured the best Motor Tricycle Track Hour Record on Monday at the Crystal Palace, covering 38 miles 1,141 yards in the hour.

in place by three set screws. In the cars shown, the ignition plugs were screwed into vertical tubes connected by bends and nipples with the combustion chamber, instead of being screwed direct into the cylinder casting—this being done in order to reduce the risk of pre-ignition and in order to prevent undue racing of the engine in the hands of novices. The pipe connections can, of course, be easily removed, and the plugs inserted direct in the usual manner without difficulty. The centrifugal governor is mounted separately alongside the crank-chamber and is driven by a chain. The crank-chamber itself is made in three pieces, the central portion being of gun-metal, and providing the bearings for the crank-shaft; the upper and lower castings are aluminium, the latter being removable without disturbing any moving parts. The outside bearings for the crank-shaft are fitted with split bushes, which are turned taper on their outside faces, and can be adjusted for wear by forcing them inwards so that the taper faces cause them to contract. The Company showed an 18-h.p. chassis, which is typical of all four types. Amongst the unusual features may be mentioned the method adopted for applying the outside brake-bands to the brake-drums on the rear hubs. These brakes are operated by a side lever, which is fixed to the end of a transverse shaft passing across the frame, and having bevel-wheel segments fixed to its two ends. These segments engage with small bevel wheels mounted upon the forward ends of shafts, which tighten and loosen the brake-bands according to the direction in which they are rotating. The shafts have left- and right-hand threads cut upon them, upon which ride the threaded extremities of the brake-bands. The strain imposed upon the shafts when the brakes are applied is taken by brackets fixed to the rear axle and terminating in forks which project upwards and engage with thrust rings on the shafts. A very powerful brake action is obtained. Flexible couplings are fitted on the two ends of the countershaft, and they are enclosed in small metal boxes which ride freely upon the shaft and retain oil within them. The thrust of the clutch, and the thrust imposed by the bevel gearing on the second-motion shaft, is taken by hardened steel end-pins. Ring lubricators are provided for the outside countershaft bearings, and the foot-brake on the countershaft is of the metal-to-metal double-acting kind. The change gear provides four forward speeds and a reverse. The steering gear is so constructed that any wear or backlash can be taken up; eccentric brasses are fitted for this purpose. The rear axle is tubular, and the ends upon which the wheels revolve screw into place and can therefore be renewed separately. The steel axles upon which the front wheels revolve are also separately fixed to the steering heads. The ignition coils employed are fitted with double tremblers and are mounted upon the dash. The Deschamp cars appear to be well built, and the carriage work on the vehicles shown by the English agents is good. The 7 and 14-h.p. engines have cylinders 95 mm. bore by 150 mm. stroke. Those of 9 and 18-h.p. have a bore of 100 mm. and a stroke of 130 mm.

Botwood and Egerton showed three Gobron-Brillié vehicles which do not differ materially from earlier models of the same make, in which it will be remembered that a vertical balanced engine, each cylinder of which has two pistons, is employed. They are, however, of somewhat lighter construction, and the wheel base has been lengthened. Samples of the new Primus cars were also shown on the same stall, fitted with single-cylinder and twin-cylinder motors. The leading characteristics of these vehicles are as follows:—The engine is placed beneath the bonnet with the crank-shaft lying across the frame. The power is transmitted by a belt running on fast and loose pulleys from the crank-shaft to the first-motion shaft of the change-speed gear. The gear-box encloses spur wheels mounted upon the first-motion shaft, and corresponding wheels which are mounted upon sleeves rigid with the shell of the differential gear. The two halves of the countershaft pass through these sleeves, and the differential itself is inside the gear-box. Either gear is brought into play by sliding the required wheel into mesh in the well-known manner. The ends of the countershaft are supported in bearings fixed to the main frame, and the power is transmitted to the rear wheels by side chains. The motor is especially noticeable in consequence of the fact that the valves can be removed together with their seats and that the exhaust valves are



Two Views of the Weller 4-cylinder Engine (which we referred to last week, page 146).

placed in the cylinder heads. The sides of the bonnet are formed of radiators, and the water is circulated through them on the thermosyphon system.

The Continental Automobile Company, of King Street, Regent Street, showed the new 20-h.p. "F.I.A.T.," which was on view at the Paris Exhibition, and also some of their "Continental" cars, which were shown by Messrs. Henriod at the Salon. They also had one of the earlier 16-h.p. "F.I.A.T." vehicles on the stall. The new chassis was one of the most up-to-date vehicles, and is the only machine of Italian manufacture which was on view. The engine is of the 4-cylinder type, and has mechanical inlet valves and low-tension igniters. The inlet and exhaust valves are arranged on opposite sides of the cylinders, and both the cam-shafts are hollow. A centrifugal governor is mounted on the forward end of the exhaust cam-shaft, and the rod which connects it with the throttle valve and the accelerator passes through the shaft. The inlet cam-shaft also has other cams mounted about it for operating the low-tension igniters, and these cams are acted upon by a central rod in such a manner that the time of ignition is varied by it. The rod itself is controlled by a centrifugal governor mounted inside a spur wheel which drives the magneto. This wheel lies immediately in front of the spur wheel on the end of the cam-shaft by which it is driven from the crank-shaft. The governor automatically advances the moment at which the igniters break the circuit in the cylinders, and at the same time causes the magneto to generate the maximum current at corresponding moments.

The main frame of this machine is made of wood and steel, and the engine is carried upon an underframe. The change-speed gear is supported by tubes which enclose the counter-shaft, and which are fixed to the main frame; the front end of the gear-box is attached at a central point to the underframe. Side chains are employed, and the double-acting brakes on the rear wheels are of the compensated internal type. A honeycomb radiator built up of square tubes forms the front of the bonnet, and the air is drawn through it by a belt-driven fan placed just behind it. The main frame is supported on very long semi-elliptic springs, and the rear axle has an H section. The method employed for feeding lubricating oil to the engine from a lubricator on the dashboard is unusual. A pipe leads from the circulating water system to the bottom of the lubricator, and the oil, which floats upon the water, is forced up by it, flowing through sight-feed glasses to the feed pipes. A gauge glass indicates the level of the oil and water in the container, and a cock is provided for drawing off the water when all the oil has been displaced by it. The "Continental" vehicles are made in single cylinder sizes of 6 and 9-h.p., a twin-cylinder size of 14-h.p., and four-cylinder of 24-h.p. They all have tubular frames, and are of the live-axle type. The change-gear provides three speeds and a reverse, and a direct-through-drive on the top speed. The gearing itself, and the general arrangement of parts, resembles the well-known models of many other makes. These cars, several of which were shown, are being put upon the market at popular prices.

Crystal Palace Show.—The Gladiator Stand and Sign which gained the 1st Prize at the Paris Salon. The Panhard and Levassor Stand is seen in the next row.

The F.A.C. cars, which are made with 12-h.p. and with 24-h.p. motors, having twin cylinders and four cylinders respectively, are the special type sold by the Farman Automobile Company. These machines do not call for any special notice, as they are built throughout on well-known Panhard lines. No underframe is used, the engine being fixed to the main frame, and the weight of the gear-box being taken partly by the countershaft. Three and four forward speeds, respectively, are provided, and a reversing gear.

A 6-h.p. voiturette, with nicely-finished tonneau body, was shown by the Firefly Motor Company, of Croydon, as also a 9-h.p. Firefly car. The smaller machine has a tubular frame, and is fitted with a 6-h.p. De Dion or a 6½-h.p. Aster engine. The gearing gives three speeds and a reverse, and has a direct-through-drive on the third gear. The method of transmission is by universally-jointed - longitudinal shaft and bevel drive to live axle. The side brakes are of the internal type, and the lever applying them, as also the foot - brake-pedal, disengages the main clutch when operated.

The larger car has a 10-h.p. twin-cylinder Herald engine, and the change-gear gives three speeds and a reverse, a direct-drive from the clutch to the bevel gear driving the differential countershaft being obtained on top speed. Side chains are used, and flexible couplings are provided between the clutch and the gear-box and in each half of the countershaft. In this vehicle a transverse spring connects the rear ends of the back springs together, and is itself fixed centrally to the main frame. The same Company showed an up-to-date 24-h.p. motor having four cylinders, in which mechanically-operated inlet valves are arranged on the same sides of the cylinders as the exhaust valves, all the valves being worked from a single cam-shaft. The commutator is carried upon the top of a vertical shaft which is driven by bevel wheels from the rear end of the cam-shaft.

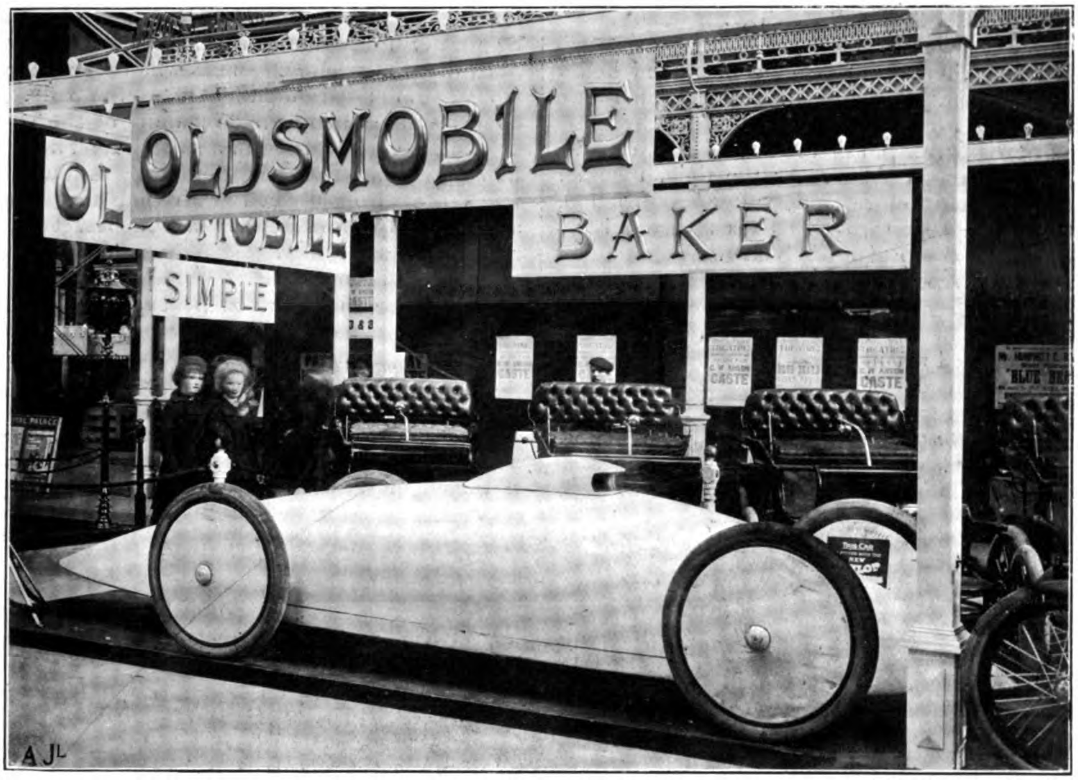
The Stand of The Automotor Journal.

The Wasse cars are, so far as we are aware, new to this country; they are made in two sizes, one having an 8-h.p. and the other a 16-h.p. motor, they are of the live-axle type, with universally-jointed shafts passing from the gear-box. The engines have mechanically-operated inlet valves arranged opposite the exhaust valves. The centrifugal governor is mounted on the front of the inlet cam-shaft and operates a throttle valve on the Wasse carburettor. The commutator is carried on the rear end of the exhaust-cam-shaft. A belt-driven lubricator is mounted on the dash and a radiator built up of a large number of vertical water-tubes forms the front of the bonnet, the air being drawn through it by a belt-driven fan. High tension ignition plugs are screwed into the inspection plugs above the inlet valves. The small handles for regulating the speed of the engine are fitted to the steering pillar, and except that they are mounted below the steering-wheel are somewhat similar in arrangement to the device adopted on the latest Panhard cars.

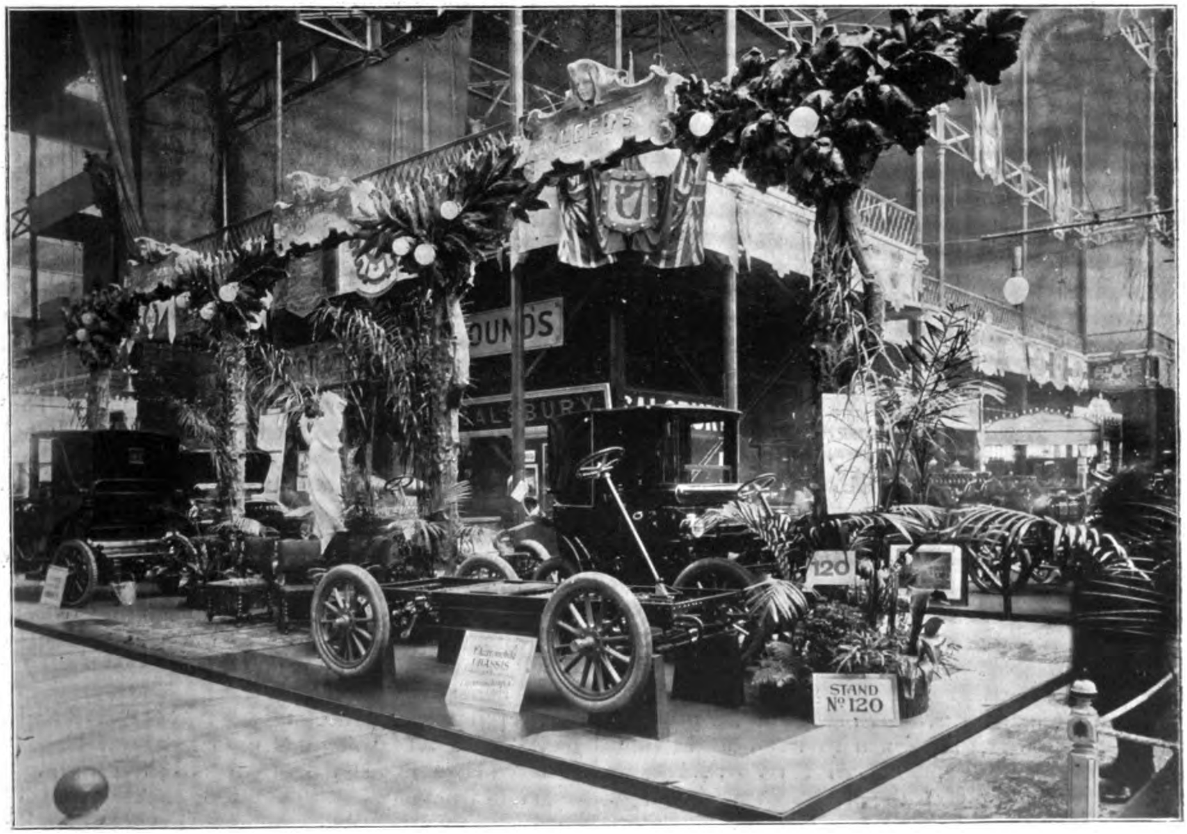
The "Belle" cars shown by E. J. Coles and Co. were of the small voiturette type, and are manufactured in Switzerland. The 8-h.p. tonneau has a single-cylinder engine, which is placed at an angle of 45 degrees from the vertical, with its crank - shaft lying transversely across the frame in front. The inlet-valve is atmospheric, and the exhaust-valve-seating can be entirely removed with the valve. A surface carburettor is employed. The engine is supported on a dropped frame, which is fixed to the main frame. The power is transmitted from the crankshaft by a chrometan leather belt, having a canvas core — the belt runs upon fast and loose pulleys on a first motion countershaft, and the rear wheels are driven by side chains from sprockets on the ends of a second-motion differential countershaft. Three speeds and a reverse are provided on the Panhard system, the spur wheels for which are carried upon the two countershafts, both of which pass right across the car. This vehicle is specially intended for doctors' use. The steering pillar is arranged centrally in order to enable the driver to dismount on either side of the car.

We are again obliged to postpone fuller descriptions of the steam vehicles which were shown, and of the excellent displays made by the best known tyre manufacturers. Certain other electrical vehicles, motor bicycles, accessories, and other exhibits have also yet to be dealt with.

(To be continued.)



The "Baker" Electric Racer.—Shown by the Anglo-American Motor Company.

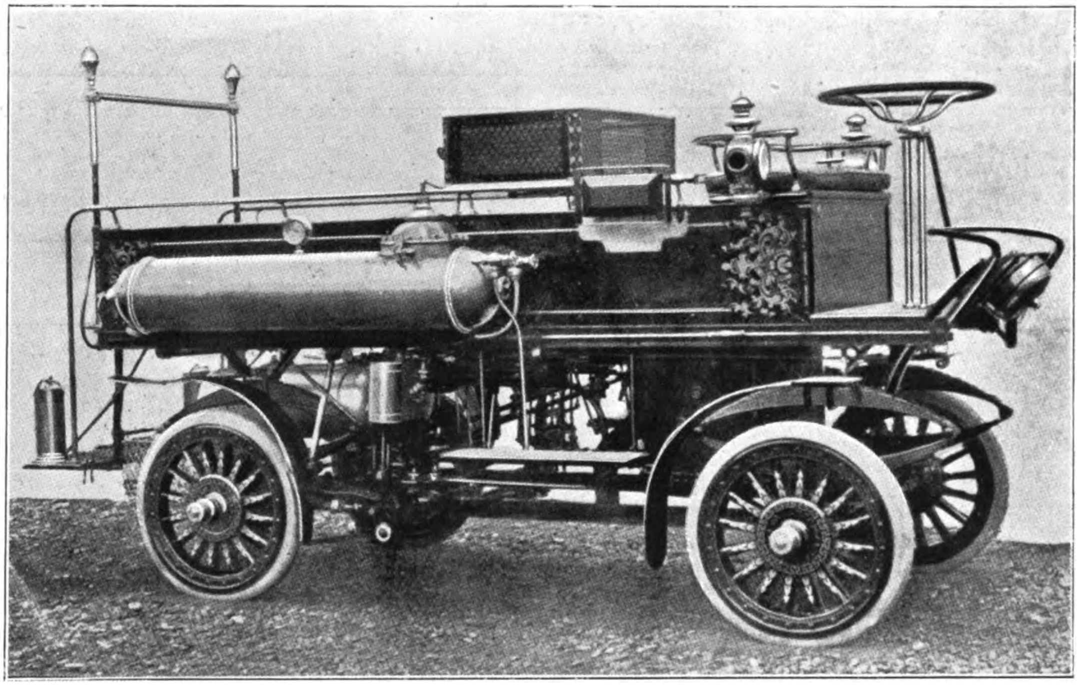


The Electromobile Company's Stand.

AN AUTOMOBILE CHEMICAL FIRE ENGINE.

The very interesting chemical fire engine illustrated below is a vehicle quite recently built by the International Fire Engine Company, of Elmira, New York. It was recently subjected to an exhaustive trial in the city of Newark, the Fire Commissioners being on board at the time, together with a representative of the Fire Underwriters' Association. We understand that it went through its tests very satisfactorily, and earned the approval of the body of experts under whose supervision they were carried out.

Chemical fire engines adapted for hand and animal propulsion have been in use for some length of time, and one or two self-propelled machines of this kind have been constructed on this side of the Atlantic, a notable instance being the recently constructed petrol-driven engine built for the Liverpool Fire Brigade. The machine which we now illustrate, however, is probably the largest of its class yet made. The principles involved in the operation of a chemical fire engine are, of course, no longer novel, but as they are, perhaps, not very widely understood it may be as well to recapitulate them briefly for the benefit of our readers. An ordinary fire engine is simply a powerful pump, water being pumped into a receptacle by the steam pumps of the engine against a cushion of air, and ejected in a regular powerful stream from the hose. No pump is needed in the case of a chemical fire engine. Its reservoirs contain a practically saturated solution of ordinary washing soda. When it is desired to extinguish a fire, sulphuric acid is poured into the solution of soda. This at once generates an enormous quantity of carbonic acid gas, which supplies the pressure for ejecting the fluid which is then a solution of carbonic acid, sulphate of soda, and soda. As the liquid falls it gives off a plentiful supply of the gaseous carbonic acid which is in itself a very powerful fire extinguisher. Chemical fire engines are generally credited with having between ten and twenty times the capacity for putting out fire possessed by a water fire engine delivering a similar stream of fluid.



In the present fire engine as will be seen the soda water tanks are mounted on either side of the body. They are of copper and each contain 80 gallons of the solution. The sulphuric acid is carried in a small header from which it can be emptied into the soda solution by turning a lever. The tanks are also supplied with pressure gauges and an adequate supply of hose in a wire basket is carried at the rear, extra hose being likewise taken in the metal box above the centre of the vehicle.

The fire engine is driven by two double-cylindered vertical steam engines mounted one on either side and driving each rear wheel independently by chain and sprocket transmission. One of these engines is clearly visible underneath the soda-water tank. The fuel for steam raising is petrol, the petrol tank being seen behind the engine in a horizontal position, the water tank being just behind it. Each of the engines operates two water pumps from its crosshead, there being also auxiliary steam pumps. The boiler is of the water-tube type; it is situated vertically under the driver's seat and is fired by a gasoline burner of the familiar type. It is 36 inches in diameter and is fitted with three tri-cocks and a water gauge. A steam gauge is placed on the footboard in full view of the driver, as also a pressure gauge for showing the air pressure in the petrol tank. The exhaust steam from each engine passes through a muffler before entering the atmosphere through the exhaust pipe. The throttle is controlled by the small wheel visible under the driver's seat, and the cut-off is regulated by a hand lever beneath the steering wheel. The steering is of the vertical pillar and wheel type. A foot brake works shoes on the rear wheels, and is operated by a horizontal rod shown above the sloping footboard; it can, therefore, be operated from any position on the driver's seat. The total weight of this chemical fire engine is about 7,000 lbs. The frame is of channel steel and the body of sheet-iron.

PARIS-MADRID.

The full regulations governing the racing section of this event are now available. Since November 15th last we have published from time to time the leading alterations and innovations which have been determined upon officially by the A.C. de France in connection with this race. For the convenience of our readers, however, we summarise the chief main points of the rules as now published in their completed form.

There will be four categories, viz.:—Cat. 1, cars weighing from 650 to 1,000 kilogs.; Cat. 2, 400 to 650 kilogs.; Cat. 3, 250 to 400 kilogs.; Cat. 4, 50 kilogs. and under. Cat. 1 and 2 must carry at least two passengers side by side of a minimum weight of 60 kilogs. each. All weights are taken light without passengers, fuel, accumulators, lamps, tools, baggage, &c. 7 kilogs. will be allowed to cars fitted with magneto ignition. Cat. 1 and 2 must convey during the entire run a member of the A.C. de France, of the Spanish Club, or one of the recognised clubs. The order of starting on the first day at two-minute intervals will be determined by ballot. On the second day vehicles will start in the order of their arrival the previous day. At the end of the second stage a provisional classing of the first five vehicles since the start from Paris will be made, and the order of running on the last day will be (1) for the first five cars at intervals according to the provisional classing ranging from two minutes up to a maximum of fifteen minutes. The rest of the vehicles will, as before, be sent off in the order of arrival the previous night, at intervals of two minutes. The Control for each day's run will be officially closed at 3 a.m. the following morning, arrivals after this hour being unclassed. All times will be strictly noted, and within twenty-four hours reported to headquarters. The "Parcs" or daily stopping depôts will, as before, be strictly closed to all persons except certain officials. The driver of each car upon arrival will only be allowed to stop the motor and immediately depart, with the exception of, in the case of petrol vehicles, to cleanse the cylinders whilst still warm, and for steam cars after putting out the fire to blow off the boiler, two minutes will be the maximum time allowed. Otherwise the car and machinery must be left absolutely untouched either for oiling or any other reason. Next morning, upon the word to start being given, the time will be booked against each vehicle, which must at once proceed outside the garage or be pushed out, and any time taken in oiling, repairs, &c., will be debited to the running time of the competitor. The arrangements for taking the times and controlling competitors through neutralised portions will be extremely strict and rigorously enforced, the timing and other operations being mainly based on the lines adopted by the British Club for cars when in control, except that each vehicle will upon arrival at the Control be conducted through the neutralised portion by a pilot who must under no circumstances be passed. If the competitor passes a Control without stopping, in the event of his being able to prove that the officials were not at their post he will be penalised to the extent of the time allowed for traversing the neutralised portion, but if he is unable to prove the absence of the officials then he will be penalised to the extent of thrice the time allowed for the traversing of the Control. Entire disqualification may follow if the passing has been intentional. A special and novel official box will be supplied to each competitor at 10 fr. for the safe carrying of the official time sheets, &c., the fee being returned upon the return of the box to the A.C. de France after the event. As usual, numbers will be carried, and no advertising announcements will be permitted on any of the cars. The marking of parts will be as follows:—(*a*) Categories 2, 3, and 4, the axles and the hubs; (*b*) Category 1, the motors (gear-case, cylinders, and combustion chambers), the chassis, the hubs of the wheels, and the back axle. No changing of marked parts will be allowed. The order of starting will be balloted for on February 16th by all applicants up to February 15th, after that date all applicants will start in the order of their entry. The entry fees are:—Category 1, 400 fr.; Category 2, 300 fr.; Category 3, 200 fr.; Category 4, 50 fr. After April 15th until the final closing of the lists on May 15th, entry fees will be doubled. Anyone entering a single vehicle need not at the time specify the make of car, but must be on the vehicle during the whole race. Any person entering several cars must at the same time give the makes of the cars and supply the name of the driver of each car before May 15th. In addition to entries by individuals, groups of vehicles can also be entered or designated for a special classing, that is, each maker may notify in each category a group of four cars of their make, notice of such group having to be given by May 20th, after which date no change in the grouping of the cars will be allowed. The nomination of one group only from each maker in each category will be permitted. These groups will be ultimately classed as follows:—Group 1, 4 vehicles arriving out of 4. Group 2, 3 vehicles arriving out of 4. Group 3, 2 vehicles out of 4. Group 4, 1 vehicle out of 4. In Group 1 the classing will be determined by the total times of the four vehicles. In the other groups the classing will be determined by the total distances run by the various cars of each group. The road will be carefully mapped out and guiding signs erected, various coloured flags signifying different meanings, viz: a yellow flag, stop; blue, a dangerous or congested district. Controls will be marked by a large banner stretched across the road with the word "Controle." Outside assistance to competitors will not be allowed either by means of special repair vehicles, or by friends. All repairs, &c., must be effected by the mechanician and those on board the car. Traversing the course before the race at a speed exceeding the legal limits may entail disqualification. All protests must be lodged within four days of the arrival of the first vehicle at Madrid. The special Commissioners for France are: Prince d'Arenberg, M. H. Huet, and Count de Vogue. For Spain: the Duke d'Arion, M. L. de Errazu, and M. Quinones de Leon. It is obligatory on all competing cars that they should be on view for two days at the Exhibition in Madrid which will be organised by the Spanish Club.

The entries now total to over 123. The latest include Mr. J. A. Holder, Hon. C. S. Rolls, J. E. Hutton, 8 Darracqs, 9 Clements. and 3 Gladiators.

The route and the stages for the Tourist Section of the Paris-Madrid is announced, viz., in France:—1st day, Paris-Pougues; 2nd day, to Royat; 3rd day, Viaduc de Garabit-Murat-Vic-sur-Cero; 4th day, Rocamadour or Alvignac; 5th day, Cahors-Agen; 6th day, Biarritz-Saint-Sébastien; 7th day, no travelling.

In Spain:—1st day, Saint Sébastien-Zaraus, Bilbao; 2nd day, Vittoria; 3rd day, Miranda del Ebro, Burgos; 4th day, Venta de Banos, Valladolid; 5th day, Salamanca; 6th day, Avila, Madrid.

The start will be on May 12th, and a silver medal will be awarded to every vehicle arriving in Madrid. Entrance fee 200 francs. In regard to the neutralisations, M. Gabriel, who has been over the route, thinks there will not be more than a dozen neutralised portions throughout the entire run.

The A.C. de Touraine, who are organising a series of automobile competitions from April 16th to 20th, are formulating their rules on distinctly novel lines. The principal event will be a Tourist Competition for heavy and light cars and voiturettes, the various items taken into consideration being comfort, elegance of design, ease of working, regularity in running, cost price, the working cost per kilometre of distance covered, the weight as affecting undue wear of the pneumatic tyres. The distance will be 300 kiloms., to be covered on April 17th and 18th, April 19th being devoted to an Exhibition of the competing cars. The classing will be determined as follows:—1 point per 100 fr. (or fraction) by the catalogue price; 5 points per centime (fr. ·01) of the cost of running per car kilom.; 1 point per 10 kilogs. of dead weight per seat; 5 points per kilom. for an average speed over 40 kiloms. per hour throughout the run; 2 points per kilom. for speed over 30 kiloms. per hour on a hill-climb of 5 to 8 per cent. during the run; 1 point per kilom. for speed above 70 kiloms. per hour on a flat kilometre speed trial during the run. Comfort, 0 to 5 points; appearance, 0 to 5 points; silence, 0 to 5 points; ease of handling and accessibility of parts, 0 to 5 points. For the cars another co-efficient is introduced of 1 point per minute of stoppage through breakdowns due to any causes other than tyre troubles.

A competition of head lamps will also be held. Competitors will have to charge and light their apparatus in the presence of the judges, and the duration of each light without recharging will be timed, the facility of charging and lighting being noted. A second lamp of each make will, after two hours' burning, be extinguished, and on the following evening re-lighted, when the jury will again note the ease and facility with which it burns upon this occasion. Note will be taken of the ease of cleaning the lamp after it has burned itself out. The awards will be based upon the prime cost, the cost per hour of supplying the light, the time of burning without recharging, the intensity of the light, the ease of recharging, lighting, and cleaning, and the size and the weight of the lamp.

The Nice Meeting has been refused authorisation by the French authorities, so far as the Circuit du Sud-Est is concerned, which consists of a road race from Nice to Aix, Senas, Salon, and back. In like manner the Pau road race is also prohibited.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

FOREIGN TYRES AND THE 4,000 MILES TYRE TRIALS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With reference to the recently published results of the Tyre Trials organised by the Automobile Club, may we ask you to kindly publish the enclosed letters. We ask you to do so because of the equivocal nature of some remarks on the subject by the Club Journal, and the refusal of the Club to deal with the matter as shown by copy of their letter enclosed.

Yours faithfully,
For The Dunlop Pneumatic Tyre Company, Limited.
LOUIS M. BERGIN, *Secretary.*

[*Copy of enclosed Correspondence.*]

To the Editor of THE AUTOMOTOR JOURNAL.

DEAR SIR,—In commenting on the Automobile Tyre Trial Award, you draw attention to the fact that neither Messrs. Michelin or the Continental Company were represented.

We hope you will not consider it unreasonable of us to ask you to give equal publicity to the fact that every effort was made by this Company to induce both the Michelin and Continental firms to compete, and both these firms declined the competition.

We notified the Automobile Club at the time that we were offering these firms every facility, and we subsequently notified the Club that notwithstanding our efforts these firms deliberately elected not to enter the competition.

We feel sure that you will agree with us that the remarks published by you this morning need this qualification.

Yours faithfully,
For the Dunlop Pneumatic Tyre Company (Limited),
(Signed) LOUIS M. BERGIN, *Secretary.*

TYRE TRIALS.

Automobile Club,
7th February, 1903.

DEAR SIRS,—Your letter of the 29th January, asking that the Club shall publish the fact that you did all in your power to induce both the Michelin and Continental firms to compete, was considered by the Executive Committee on Monday last, when I was directed to inform you that the Committee do not see their way to accede to your request.

Yours faithfully,
The Dunlop Pneumatic Tyre Company, Limited.
(Signed) C. JOHNSON, *Secretary.*

VERTICAL AND HORIZONTAL PETROL ENGINES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Referring to the recent controversy as to the merits of vertical and horizontal engines, many people mention that big gas engine people like Tangyes, Westinghouse, &c., used horizontal cylinders. It is rather interesting to see that the latest Tangye engines are now made with three vertical cylinders, and the same remarks apply to the Westinghouse, and I think to one or two of the other big gas engine people also.

I think this may be taken as proving the superiority of the vertical type, otherwise firms such as these would not abandon the horizontal type and incur the great expense of changing their patterns.

Yours faithfully,
Jan. 31st. ERNEST H. ARNOTT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have to thank Mr. Brooke for his definition of the word balance, and think, Sir, that a brief review of the correspondence may be an advantage.

Admitting that your correspondent never directly stated that the 3-cylinder motor "balanced" better than a 4, he implied that the only one that balanced better had 5-cylinders, whilst I contend that the 3-cylinder motor is not to be compared to the 4, and that in fact as far as inertia forces are concerned it is not any better than the 2-cylinder motor. Whilst in respect to inertia mounts or couples it may even be worse, when the 3-cranks are arranged to make equal angles with each other, the weight of each set of moving parts being equal. The only point which an advantage can be claimed is that the 3-cylinder motor has a better turning movement.

On my pointing out the above Mr. Brooke concluded that I had overlooked the fact that it was not a steam engine that was under discussion, and on endeavouring to point out there was no difference between the balancing, or forces produced from the want of balance, in a steam engine and a petrol motor, I am asked to compare the balance or want of balance which exists in a *single-cylinder* motor to those existing in a *3-cylinder* motor. Why not make it an 8? The reason given for such a comparison being that I am supposed to have stated that the number of impulses per revolution is a matter of indifference as far as balance is concerned. Now, Sir, I did not make that statement in those words, but even had I done so, and if they had been used to make a legitimate comparison they would hold good.

I will now ask Mr. Brooke if he ever heard of the steam engine cycle, if so, he will know that when a *motor*, let it be a single-cylinder motor, working on that cycle gives two impulses per revolution, and a *petrol motor* working on the Otto cycle gives one impulse in two revolutions, either of these motors may be driven instead of driving, and the inertia forces or couples (if each had more than 1 cylinder) set up in each are identical, providing the revolving and reciprocating weights are equal; he may add as many cylinders and cranks as he pleases to each and compare the result, but he must not quibble and make absurd comparisons between two motors, one of which has 1 cylinder and the other, say, 3 cylinders; he might have made it 8 with equal reason. I am sorry my letters have led Mr. Brooke to the conclusion that I have had no practical experience in 3-cylinder motors, but that only shows how mistaken in one's conclusions one may be.

I would like to point out that theory does not disprove facts, but that it frequently points where we may look for them; it shows us that forces *may* balance but that two forces acting in the *same direction* cannot balance.

What the facts are that Mr. Brooke has experimentally found I don't know, but the probabilities are that he has found that a single cylinder motor set up more vibration in a car than one having 3 cylinders, and that the 3-cylinder motor was a little better than a badly balanced 2-cylinder motor, all of which theory would have pointed out.

The remainder of Mr. Brooke's letter hinges upon the absurd comparison he has drawn and, therefore, calls for no comment other than I fully endorse the statement at the close of his letter.

Thanking you in anticipation,

I am, Sir, yours truly,
B. A. LANCE.

Motor Cycle Trades Association.—Last Wednesday a meeting of motor cycle traders was held at the Automobile Club to consider the organisation of motor cycle reliability trials and advisability of one show per annum. Mr. Perman was voted to the chair, and the following gentlemen were elected to serve upon the Trials Organisation Committee, viz., Messrs. Arnott, Batson, Belcher, Citroen, Cooper, Goodwin, Hart, Jackson, Martin and Hooydonk. It was resolved that an Association be formed called "The Motor Cycle Trades Association," and a provisional committee was elected with a view to drafting a Circular and programme to be sent to the whole trade. Mr. E. H. Arnott consented to act as Secretary *pro tem.*

THE Marine Motor Association propose affiliation with the Automobile Club.

MR. CLAUDE JOHNSON has been appointed to represent the British Club on the International Commission of the Gordon-Bennett Race.

AN automobile omnibus service extending to Flamborough is to be instituted by the Holderness Motor Company to link up the outlying towns in the Holderness district. As a start the 'buses are to work between Hull and Aldborough. The scheme is supported by Dr. Bradford, Mr. Ralph J. Jackson, and Mr. Cottam, of Aldborough.

A MEETING took place recently at the Manchester Cotton Association for the purpose of permitting the extension of the transit by motor haulage along the highways. The main object was to arrange for cotton being carried from the Manchester Ship Canal wharves to Oldham and the surrounding towns. Those present were unanimous in their approval, and the scheme is to be further advanced by a second meeting to be called.

DEALING with the claim of the Wallingford butcher, T. Lester, whose horse and cart collided with the car belonging to the London Motor Garage Company, during the commemoration run to Oxford in November last, a jury last week, at the Berks Assizes, found that there was material negligence on the part of both parties, and judgment was therefore entered for the defendants in each case. The butcher claimed damages for the loss of his horse and damage to his cart, the Garage Company claiming *per contra* £300 damages to the car and loss of hire during repairs.

THAT a testimonial should be presented to Mr. Claude Johnson upon his retirement from the Automobile Club Secretaryship was a matter of course with everyone at all associated with the automobile movement. It was only a question of the right moment to initiate the proposal. Mr. Alfred Harmsworth, in a letter to the Chairman of the Club, has set the ball rolling, putting himself down for fifty guineas. It now only requires the matter to be put forward in formal shape for the subscribers' list to be quickly swelled by the many anxious to show their appreciation of the Club Secretary's work in the interests of automobilism.

THE ranks of the *tourist* motor cyclist as against the *racing* man are daily becoming more extended. Most riders naturally turn their thoughts quickly to competitions in which they can prove their skill as drivers of their machines. The ordinary racing track has no fascinations for them, and to enable this class of amateur to be catered for, Mr. Ernest H. Arnott, the Captain of the Motor Cycling Club, announces that a number of tourist competitions will be arranged for the coming season, in which all machines, down to the 1½-h.p. bicycle, will have a chance to secure a prize. This Club being run entirely on amateur principles, should receive the support of all motor cyclists seeking companionship and co-operation in furthering their pleasure and this special branch of automobile sport.

A WAIL comes to us from Walsall, the principal seat of the Midland saddlery trade. The saddlers of that town are being ruined by the motor trade, we are informed. Motors are replacing horses so fast in that enlightened neighbourhood that now not one set of harness is required for three that used to be needed, and the saddlers are getting unhappy. We are glad to find the motor car progressing so rapidly, but we are sorry for the saddlers. It should be remembered, however, that there is nothing like leather. We pointed out some time ago that the amount of leather used in motor vehicles was so great that, in spite of the diminution of demand for saddlery, the price of leather was going up, owing to the demand increasing. Workers in leather ought not to be so specialised as to only be able to make harness.

THE directors of the New Grappler Pneumatic Tyre Company announced in their annual report that their motor tyre business is steadily increasing, the tyres giving universal satisfaction. During the three closing months of last year the motor tyre orders increased over 50 per cent. as against the corresponding period for the previous year, and since September 30th the increase has been at the rate of over 650 per cent, making the orders for the three months greater by one-fifth than for the entire previous twelve months. Possibly to ensure this part of the Company's business being preserved is the reason for the Directors suggesting the liquidation of the Company. An extraordinary meeting of shareholders is to be held on the 17th inst. for the purpose of considering a resolution that it has been proved to the satisfaction of the Company that it cannot, by reason of its liabilities, continue its business and that a liquidator be appointed to wind it up voluntarily, with power to dispose of the assets of the Company.

WITHOUT any special ceremony, the sixth Edinburgh Cycle and Motor Show was thrown open to the public on Friday, last week, the Exhibition taking place as usual in the Waverley Market. Although the motor section of the Show was not complete until Tuesday last, in consequence of a number of the cars to be staged not having arrived from the Crystal Palace Show, an excellent gathering of motor vehicles was on view, totalling to nearly double the number that have ever been got together before in the Scottish capital. The chief exhibits comprised the stands of the Scottish Automobile Company, who had on view several Locomobiles and Waverley cars and a Singer tricycle; Stirling's Motor Carriages, Limited, with a good showing of their well-known cars; the Caledonian Motor Car and Cycle Company, of Aberdeen, who made a feature of Peugeot cars; the Mo-Car Syndicate, who are the makers of the Arroll-Johnston cars, which have found considerable favour in Scotland; and the Hozier Engineering Company, with their excellent Argyll vehicles. Three types of Wolseley cars were on the stand of Messrs. Rennie and Prosser, including the one recently supplied to Baron Barreto. A Napier was on J. Croall and Sons' space, and Love's Automobile Agency showed a 1903 type of Albion Car. The handy little Oldsmobile petrol cars attracted considerable attention, and the handsome Gardner-Serpollet vehicles, manufactured at York, were staged by Messrs. Middleton and Townsend, of Edinburgh. The most recent British car, viz., the Velox, was the centre of considerable curiosity at the stand of the Glasgow V.R. Motor Agency.

THE New York Madison Square Show proved a huge success from start to finish, and, as we announced last week, a large profit will accrue to the organisers of the Exhibition. The total number of exhibitors was 145, distributed over a total number of 195 spaces. Of these 81 showed complete cars. As usual, some weird stories are to hand of the business done during the week, the total amounting to some four million dollars. One firm is reported to have received orders for over 3,600 light gasolene runabouts and 450 tonneau cars, it being modestly stated that this was the largest total for any one maker. After such figures, naturally two little orders which are stated to have been placed for a total of 900 electrical vehicles are scarcely worth a second thought. No doubt the idea is to impress outsiders, but it hardly seems necessary that such statements as these should be given currency, as without question the American automobile industry has made remarkable progress during the past eighteen months, and there is little doubt that within the next year or two the American-built vehicle will have considerable influence on the prices in the automobile world.

A section devoted entirely to French automobile products will be reserved at the Leipzig Automobile Exhibition, next October.

An International competition for Post-Office vehicles is proposed to be organised, in conjunction with the French Government, by Mons. L. Perisse, of the A.C. de France.

La France Automobile has offered a special prize for the first 4-seated car in connection with the *L'Auto* Consumption Trial being held on the 19th inst. The entries for this event are now over forty, the latest including four Peugeots and two Hérald cars.

For the purpose of distinguishing the French "Circuit des Ardennes" from the Belgian event, the title of "Circuit de l'Argonne" has been invented by *L'Auto*. This distinction will save a considerable amount of confusion in speaking of the two events.

An automobile club consisting of five members is in existence in Shreveport, La., U.S.A. The *whole* of the members are stated to be most enthusiastic, which may possibly be accounted for by the laws in the district permitting a speed of eight miles an hour within the city, with no limit outside the town boundaries.

Tom Cooper, an ex-champion racing cyclist of America, it is stated, intends to endeavour to "loop the loop" in an automobile. Barney Oldfield's freak machine is stated to be the car Cooper has selected. We fancy, however, that a few mechanical difficulties will be found to arise which are likely to interfere with such a foolhardy attempt being carried through.

The competition for Timing Apparatus, organised by the A.C. de France, was held last Monday on the Dourdan record road. Out of twelve instruments entered, nine were received by the judges. Of these two proved to be of importance, viz.: That of Chevalier Stockert, and the apparatus of M. Pottier, electrical engineer to the Mors firm. This latter instrument in practice proved itself very efficient, recording accurately times to within one-fifth of a second. The arrangement is distinctly ingenious, and we hope to publish drawings of it shortly. The jury, after examining the working parts of the various instruments, have awarded the first prize to the Mors instrument, which will be used officially by the A.C. de France. The second prize goes to Chevalier Stockert.

The city of Rheims, in France, will hold an Industrial Exhibition from May to September next. Several sections are of interest to the automobilist, as the exhibition of motors of different kinds, storage batteries, automobiles, and cycles are fully provided for. The French railways have arranged for a reduction of 50 per cent. for the transport of all articles destined for the Show. It is interesting to note that a special tariff will be given to all "theaters, spectacles diverse, whatever they may be," whilst a curious classification is included under Article 7, as follows:—"All explosives and detonating materials, judged dangerous and of a character to disturb the public, and all sparkling wines, except those of Department of Marne, will be excluded from the Exposition."

The second Belgian Automobile Salon was inaugurated last Saturday by Prince Albert of Belgium. The Exhibition, which drew together a very large number of visitors, has so far been a pronounced success. A large number of the leading French makers had their latest types of cars staged either directly or through their Belgian agents, whilst all the leading home products were on view. These included a very large show of motor bicycles, led by the F.N. and Minerva types, so well known in this country, other leading makers of this small type of machine being the Red Star Antoine and Sarolea. The leading car firms included H. P. Déchamps, Cie. Belge de Construction d'Automobiles, La Pipe, La Belgica, Gobron-Brillié (whose stand was remarkable for the heavy class of vehicles shown), the Germain, with their latest 1903 types, one of 50-h.p., Passy-Thellier, and Vivinus. A steam vehicle was staged by Messrs. Jaride and Pastre; and a tractor constructed upon the principles of M. Janssens of St. Nicholas. King Leopold on Monday visited the Exhibition, driving up on his 16-h.p. Panhard.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Barton Air-Ship Syndicate (Limited).—Capital, £15,000 in £1 shares. Object, to adopt an agreement with F. A. Barton, for the acquisition of certain patents relating to navigable balloons and aerial machines, and to manufacture and deal in airships, balloons, parachutes, motors, turbines, screws, propellers, &c. The first directors are Viscount Maitland, O. C. Selbach, and F. O. Barton.

Continental Automobile Syndicate (Limited).—Capital, £100 in £1 shares.

Etesian Company (Limited), 206-212, Bury New Road, Manchester.—Capital, £500 in £1 shares. Object, to carry on the business of manufacturers of, and dealers in, bicycles, tricycles, motors, motor carriages and vans, &c. The first directors are T. P. Rock and H. B. Jones.

Parsons' Non-Skid Company (Limited).—2, Queen Anne's Gate, S.W. Capital, £2,000 in £1 shares (1,000 preference). Object, to carry on the business of makers of india-rubber and other tyres, with or without special precautions against skidding or puncturing, manufacturers of motor cars, automobiles, &c. The first directors are H. Parsons, H. Edmunds, W. J. Crampton, and P. E. Singer.

Walter Armstrong and Co. (Limited).—Capital, £1,007 in £1 shares. Object, to carry on the business of a cycle and motor manufacturer now carried on by W. Armstrong at Sunderland as W. Armstrong and Co., and to carry on the business of manufacturers of and dealers in cycles, motors, carriages, &c. Walter Armstrong is permanent governing director.

NEW INVENTIONS.

Claiming particularly to apply directly or indirectly to Motor Vehicles, &c.

Patent Specifications Published.

Applied for in 1901.

Published February 5th, 1903.

25,226. C. Rainey. Carburettors.

Applied for in 1902.

Published January 15th, 1903.

22,273. Automobiles Belgica. Radiators or cooling apparatus.
22,931. F. Schmitz. Running gear.
23,052. J. Hurber and K. Danne. Inner tubes of pneumatic tyres.
23,971. O. H. Pieper. Electric motors.

Published January 22nd, 1903.

23,746. J. Guenet. Electric ignition devices.
23,891. H. Cooper. Gas and oil engines.
4,274. Soc. Anon. "Le Carbone." Electric cells.
5,894. A. M. Milson. Valve regulating apparatus.
4,650. P. Grosjean-Redard. Distributing valves.
4,769. A. Hardt. Two-cycle internal combustion engines.

THE AUTOMOTOR JOURNAL

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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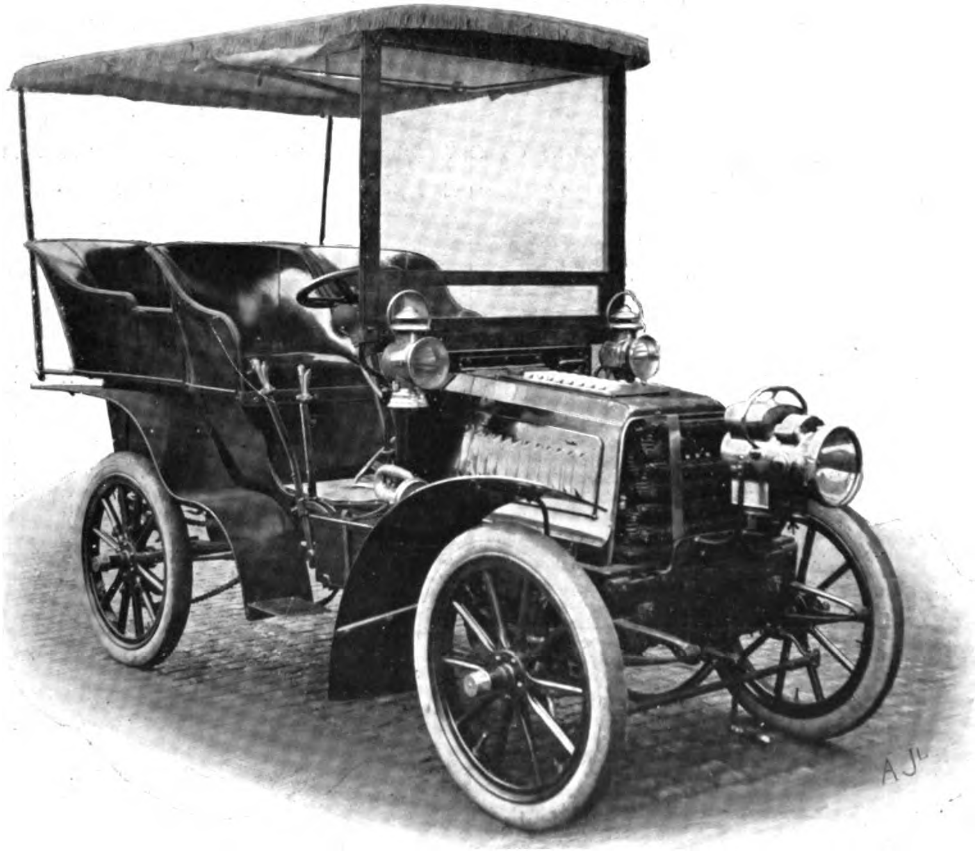

THE 9-H.P. EARL CAR. (*See* page 193.)

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CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to The Editor of "The Automotor Journal," *44, St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.	
Feb. 27 ...	... "Recent Development in the Modern Automobile." Paper by Mr. H. R. Sennett. Annual General Meeting.
March 6 ...	... Discussion on Legislative Proposals.
March 13...	... "The Motor Problem a Road Problem." Paper by Mr. W. Rees Jeffreys.
June 13 ...	... Gymkhana at Ranelagh.
August ...	... Tourist Motor Bicycle Reliability Trial.
September	... The 1,000 Miles Trial.
1904	... Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
Feb. 22-28	... Pau Automobile Week.
March 1 ...	... Competition of Silencers (A.C. de F.)
March ...	... "Criterium du Quart de Litre" (*L'Auto.*)
March 8-22	... Berlin Automobile Exhibition.
March 16-30	... Vienna Automobile Exhibition.
March 20-28	... "Criterium des Transports Automobiles." 1,107 kiloms. (*La France Automobile*).
March 21-28	... Cordingley and Co.'s Exhibition, Agricultural Hall.
March 28-April 5	Nice Automobile Week.
April 10 ...	... Eliminating Race for Gordon-Bennett Race.
April 16-20	... A. C. de Touraine Tourist and other Trials.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 12 ...	... Paris-Madrid. Start of Tourist Section.
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June	... Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-23	... Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 25-July 1 ...	Aix-les-Bains Auto Week (Auto Club du Rhone).
July 9 ...	.. Gordon-Bennett Cup Race.
July 11 ...	... Speed Trial at Dublin.
July 13 ...	... Start for International Tour through Ireland.
July 15 ...	... Motor Boats Race, Queenstown Harbour (Alfred Harmsworth Challenge Cup).
July 18 ...	... International Hill Climbing Trial at Belfast (Henry Edmunds Trophy).
July 19 ...	... Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August ...	... Circuit des Ardennes.
September	... Udine Exhibition (Italy).
Oct. 15-21	... Leipzig Exhibition.
Nov. 15 ...	... German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

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PASSING EVENTS.

THE GORDON-BENNETT RACE.

The prospects of the Gordon-Bennett race continue to be promising in the extreme. As a London daily has remarked, "the automobile has effected miracles, its last achievement being the most miraculous of all. It has united all the Irish parties." Not only are the various sections of the Nationalist party and all the local authorities, who are mostly Nationalists also, enthusiastically in favour of the race being run in Ireland and an enabling Bill being passed for the purpose, but the principal Unionist organ, the *Irish Times*, devotes a leading article to the cause, and that ultra-Orange publication, the *Belfast Northern Whig*, throws its weight unhesitatingly in favour of the measure. It even appeals to Mr. Wyndham in the name of his well-known anxiety to help forward the material prosperity of the country to procure Government support for the Bill. "Here," says the *Northern Whig*, "is an easy way whereby he can help forward that prosperity." It really seems as if the day dreamed of by Thomas Davis when Orange and Green should be united in one banner, had dawned at last. Mr. Tim Healy, who has always something pointed or to the point to say, writes that he does not see the least necessity for the petition, as "the outbursts of support" are so powerful, so spontaneous, and so unanimous. "Get your Bill drawn," concludes Mr. Healy, "and ask Mr. Wyndham or Mr. Redmond to bring it in." That is sound and sensible advice. Mr. Wyndham would, no doubt, be preferable, as the official representative of Ireland. He and his Government have recently shown themselves very conciliatory to its people. There is no reason why the Government should not bring in the Bill at an early date. They are not only conciliatory to Ireland but both individually and collectively, we believe, friendly to the automobile movement. If the measure is to be passed, it would be well to have it passed at as early a date as possible, so that any uncertainty hanging over the event may be removed as long before the race as possible. A great race like this requires organisation on a large scale. It involves great expense and the expenditure of an immense amount of personal energy by those to whom it will fall to organise the arrangements. Nobody can be really as energetic and as enthusiastic as he might be when he feels that in spite of all he may do the issue lies in the hands of higher powers to make or mar in his efforts. We hope, therefore, that the Government will see their way to introducing, or at any rate affording their support to a Bill for enabling the Gordon-Bennett Race to be run in Ireland, at as early a date as possible.

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A NEW PETROL-ELECTRIC ALLIANCE.

WE elsewhere give some account of a new form of electrical change-speed-gear which has been introduced by the Germain Company. This arrangement amounts to replacing the ordinary mechanical change-speed gear of a petrol car by an electrical arrangement which provides both great flexibility of driving and enables practically any intermediate speeds to be obtained and maintained, from the lowest up to the highest speed of which the car is capable. On the top speed the arrangement amounts to a direct-through drive with a flexible coupling, the flexible coupling being magnetic. It is, in fact, a variable-speed-gear. It is possible that it may prove a very valuable stepping stone in the development of transmission from engine to driving wheels. At present it would appear that the question of weight is rather against it for many purposes, but it may prove quite possible to considerably reduce that disadvantage in the future. At any rate the apparatus has some very good points, and we shall watch its practical development and application with much interest.

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A SUCCESSFUL COMPETITION.

WE have always been ardent advocates of the motor fire engine, so that we have pleasure in being able to record that in the case of a recent speed test organised between one of Merryweather's steam fire engines of the type described in the Journal for June 7, 1902, and an ordinary horse-drawn vehicle of the same pumping capacity of the motor, the motor fire engine came off an easy victor. The competition took place recently at the Penge Fire Station, the call being sent from the Crystal Palace Hotel, and the course accordingly being from the Penge Station up the steep Crystal Palace Hill. Both the engines, the horse-drawn steamer and the motor, were kept in readiness at Penge, the water in their boilers being maintained near the boiling point by two gas rings, the gas ring in the motor engine being likewise employed to heat the vaporiser of the Clarkson burner, and so render it ready for instantaneous use.

The route taken was *viâ* Beckenham Road to the Penge entrance of the Palace, then to the left up Thicket Road, and again to the right, straight up to the Palace, a distance of 1¾ miles, uphill all the way, with a total rise of 350 feet, the last quarter of a mile having a gradient of about 1 in 8. It had been raining heavily, and the roads were covered with thick mud, thus making the conditions extremely severe.

The call for the motor was given at 3.3 p.m. The fuel was immediately turned on, and in 1 minute 10 lbs. was registered on the steam gauge; in 2 minutes, 40 lbs.; and in 2 minutes 45 seconds, 100 lbs., the engine getting on to the road at 3.6. Steam was maintained at full pressure the whole way, and the top of the hill was reached at 3.15½. Within 1½ minutes the pumps were coupled up, connected to the hydrants, and two powerful jets were thrown to a height of over 100 ft. The call of the horse steamer was given at 3.12, and in 2 minutes the horses were in the machine and under way, the top of the hill being reached at 3.27, at a walking pace, with all the men dismounted and the horses, although splendid cattle, very nearly dead beat. The motor steamer was thus 2½ minutes quicker than the horsed engine from the time of the call, and took 3½ minutes less on the road.

A return to the station was made down the hill the other side of the Palace, both engines running together, the motor easily outstripping the horses, being, of course, far more under control, and travelling about 15 miles per hour.

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A FIELD FOR SELF-PROPELLED TRAFFIC.

THE *Asiatic Quarterly* for last month contains a contribution which should give serious grounds for reflection both to automobilists and railway engineers. India, it is pointed out, has been provided with an extensive and well-organised network of railways, but the traffic receipts of the railways are not increasing, and they contribute little to the development of the country or the prosperity of the inhabitants. The reason of this is two-fold. There is an inadequate network of common roads to feed the railways, and the means of communication on the roads there are, are antiquated and out of date even for animal traction. Here surely ought to be a field for the automobile, assisted possibly by some Indian representative of our Roads Improvements Association. Railways are of little use to a purely agricultural community unless the agriculturists have ways of bringing their produce quickly and cheaply to the rail. Their whole prosperity depends upon their being able to command wide markets. Of course, in India, in spite of extensive railway enterprise, railways are much further apart than they are in the British Islands, and if the roads and means of communication were as good in India as here, the automobile would still have an almost greater field before it there than in this country. As it is, the making of new roads and the introduction of automobiles suitable for agricultural purposes may probably mean a revolution in the prosperity of India.

THE engineering and building of new roads ought not to prove a serious difficulty. Labour is cheap and abundant in India of the kind required, and the Government expends large sums in relief works often of very little utility. Here is one where the money expended would not only be useful in the alleviation of famine, but would tend to prevent its recurrence in the future. At present the application of the automobile in India must necessarily be somewhat limited, owing to the Government restrictions as to the carriage of petrol. How far climatic conditions may interfere with its transport seems a little doubtful. Probably such difficulties will ultimately be satisfactorily overcome. There is already a prospect of the official restrictions being relaxed—at any rate, there should be a large field for the heavy oil and coke fired steam wagon almost immediately. It is a field that manufacturers should take into consideration at once.

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MR. SCOTT MONTAGU ON A SIMILAR TOPIC.

THAT a very similar state of things prevails in this country, in spite of its more extended railway system, is one of the valuable lessons which Mr. Scott Montagu's paper, read last week before the Automobile Club, should very forcibly bring home to English railway men. There has been a good deal of desultory discussion in the Press on the depreciation of English railway property. There has also been a good deal of latent hostility to the automobile movement on the part of the railway companies. Their attitude has been more moderate than in the red flag days of the sixties, but their action in regard to the carriage of petrol recently has provided fairly unmistakable evidence that though the hostility may be latent it is not extinct. Hostility between great industries is invariably a waste of energy, time, and temper. Mr. Scott Montagu in his paper comes forward as the wise and sensible proposer of a scheme which, if realised on any scale in the near future, would go a long way towards abolishing this ancient feud altogether, and converting the motor car into the friend and minister of the railway companies, and the railway companies, presumably in consequence of the resulting friendly co-operation, into the patrons and supporters of the automobile. Mr. Montagu proposes that the railway companies should organise automobile services to feed their country railway stations and collect passengers for town. People who have regular business in London cannot at present, if they live in the country, unless they have means of locomotion of their own, live at any distance from a railway station. As Mr. Montagu correctly says, a man living four miles from such stations as Woking or Bishop's Stortford might as well be at Bedford or Brighton, as far as facilities for reaching London are concerned. The result is that dwellings concentrate round country railway stations, giving them often a sordid and squalid air, which is exactly not the kind of atmosphere the man who wishes to live in the country, desires. If he could live five or six miles from the station, and be fetched every morning to his regular train by an automobile service run by the railway company at a moderate cost, a revolution would soon be effected in the conditions of life of large classes of the population, and the railway companies would find that country stations, where they now have but half a dozen wealthy season ticket holders, would soon be sending a regular stream of passengers to and from London every day that would rapidly increase their returns, and appeal very pleasantly to the shareholders in the form of increased dividends. It would also largely increase health and happiness of a large number of busy men.

A NEW MEANS OF CHARGING CELLS FROM ALTERNATING CURRENT STATIONS.

THE Hewitt mercury-vapour electric lamp is attracting a good deal of attention in the Press generally. It is an exceedingly interesting lamp, though perhaps the inspired correspondent who went to see it at the Westinghouse Company's rooms, and afterwards described the premises as being hung about with fixed flashes of lightning, was letting his imagination run away with him, or had been particularly well treated by the exhibitors. The colour it emits is not unlike that of lightning, being deficient in red and yellow rays, but it is as steady as a rock, and has the extraordinary efficiency of less than half a watt per candle power, that is to say, it gives about five or six times as much light for the same current consumption as the incandescent carbon filament. Its construction is simple. It resembles a big thermometer about a yard long with a bulb about half full of mercury at the bottom and a wire sealed into its top and bottom ends. The air is exhausted from it and the terminal wires are connected to the ordinary electric lighting mains, and as the lamp is very accommodating any pressure from 50 to 500 volts will suit it. When so connected, however, the lamp will not immediately commence to diffuse light. It has to be started by a high-tension induction-coil spark, similar to that employed in the ignition of explosion engines. Once the spark has passed, some of the mercury is turned into vapour and forms a path along the tube through which the ordinary low pressure current can pass, and the lamp then diffuses its light. All this may or may not be of interest to automobilists, but what is of interest to them is that the Hewitt lamp forms a kind of electric valve. It is one of those rather rare instances in which an inventor, while pursuing one line of enquiry has lighted on a discovery of scarcely less importance than the one of which he was in pursuit. It has been found that the current will only pass in one direction through the Hewitt lamp. If connected up in an alternating current circuit, therefore, and put in series with a battery of accumulators, it will only permit a uni-directional pulsating current to pass through the battery. By a suitable arrangement of transformers, and arranging a couple of lamps in parallel, or arranging two or more additional terminals inside one lamp, a steady direct current can be obtained from an alternating supply, the action being not dissimilar to that of the Nodon rectifier to which we have previously referred. We understand that the apparatus makes a very efficient, cheap, and reliable rectifier. It only produces a drop of 14 per cent. of the voltage, and for that a considerable amount of light is obtained in addition to the direct current—a benefit where it happens to be required. When commercially developed, the apparatus will probably be found very effective for charging accumulators at alternating current stations. How far it can be adapted for charging ignition cells is at present uncertain—the voltage at present required being somewhat too high.

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THE A.C. de France have officially accepted July 9th as the date for the Gordon-Bennett Race, provided it is run in Ireland. It is possible, however, that it may be necessary to advance this date by a few days. It has been decided against the transference of the route to Kerry County after inspection of the roads, but possibly a hill climb may be arranged in this county just outside Tralee, on the Kilorglin Road.

THE EARL PETROL CAR.

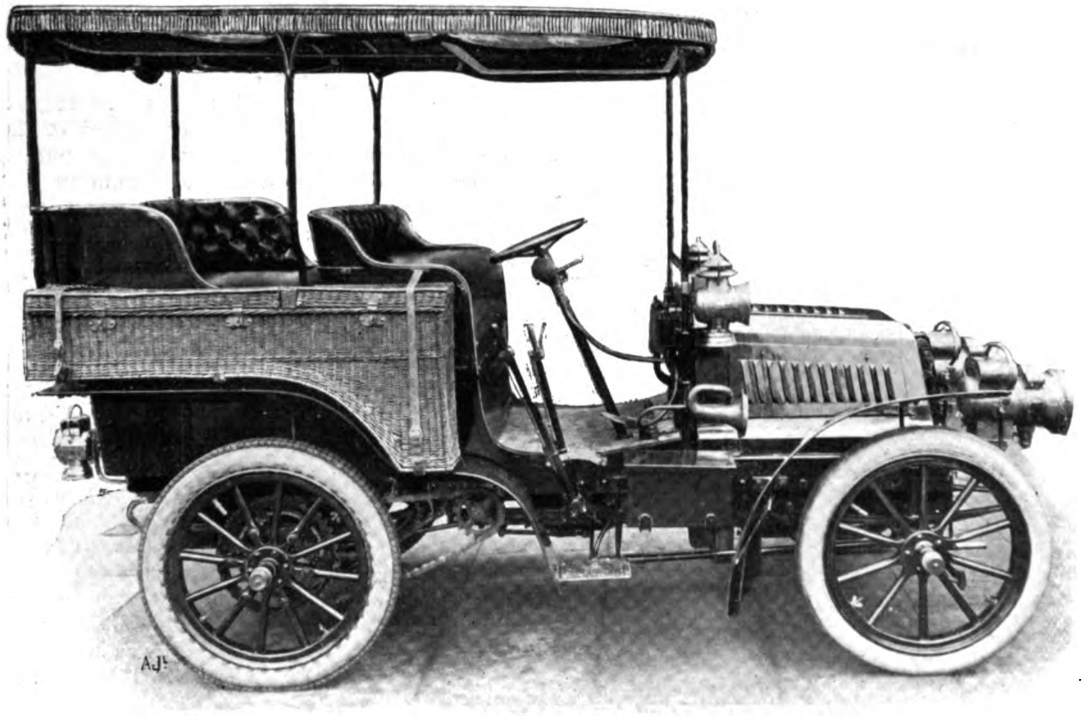


FIG. 1.—Side View of the Earl Car.

THE "Earl" is the name which the Great Central Garage Company have given to the 9-h.p. petrol vehicle, which they specially recommend to their customers. It is a car weighing about 15 cwt., and as it is built in general respects on well-known lines it does not require any very detailed description. One of them is shown in our frontispiece, and another is illustrated in Fig. 1. Fig. 2 is a photographic plan of the chassis, in which the mechanism is clearly shown, and Fig. 3 is another view of the chassis, in which the regulating levers and pedals, together with the lubricators and the gear box, are prominently seen.

The main frame is constructed of wood and steel, and is rectangular. It is stiffened by a tubular cross-member which lies beneath the dashboard, and by another transverse member which has an angle section, and forms a part of the underframe, upon which the engine and change-speed gear are mounted. The underframe is also secured to the main frame by brackets further forward. The method of suspension is normal, semi-elliptic side springs being employed above the front and rear axles. The springs are long and easy, and are made by the famous Lemoine firm. Wooden wheels are used, fitted either with Dunlop or with Clipper-Michelin tyres.

The engine is of the twin-cylinder vertical pattern with atmospheric inlet valves arranged immediately above the cam-opened exhaust valves. The two cylinders are cast in one piece, and their water jacket passes round the valve chambers. The inlet valves are held in place by a single nut and yoke piece in much the usual way. Separate exhaust pipes are led from each cylinder, the two joining together at an acute angle at some little distance from the engine, and the common pipe being led to a large exhaust box fixed across beneath the frame above the rear axle. Provision is made for fitting tube ignition if required, but high-tension electric ignition is, as a rule, alone employed, the ignition-plugs being screwed into the valve chamber in a horizontal position. The crank-chamber is made of aluminium, in two pieces, with a joint between them dividing the main bearings of the crank-shaft. The cam-shaft is driven in the usual way by spur wheels, the larger of which contains a centrifugal governor, and both of which are enclosed in an oil tight casing. The governor is of large size, and is connected with the exhaust cams in such a manner as to slide them out of engagement with the valve spindles when the engine speed exceeds a certain rate. An accelerator pedal to the right of the foot-board is connected through an enclosed spring with the sliding cams, so that the normal speed of the engine can be varied at will. In the engine which we examined, when running light this "hit and miss" action allowed it to run some 85 revolutions after the governor had "cut out," and before again "cutting in," the result being a very steady action when the car was at rest. This effect is due, to a great extent, to the large flywheel employed.

The speed of the engine can be regulated from levers on the steering pillar, a throttle valve regulating the mixture, and a timing device varying the moment of ignition.

The carburettor is of the Longuemare type; it is jacketted with exhaust gases, and it takes a supply of warm air from the neighbourhood of one of the exhaust pipes, the air pipe terminating in a perforated T socket which is clipped around the exhaust pipe. The cooling water is carried in

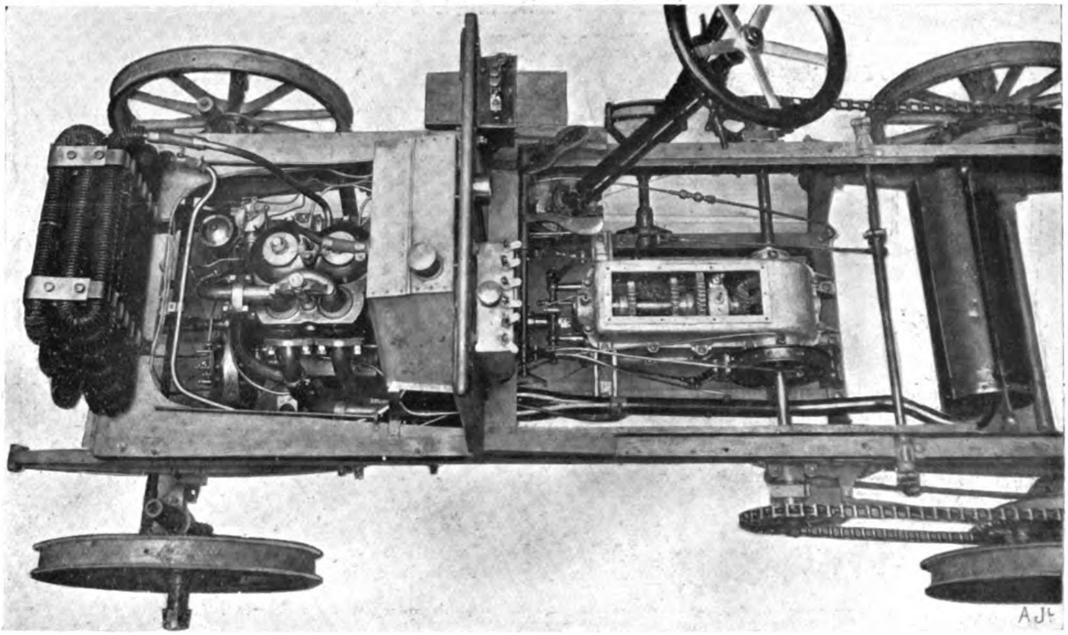


Fig. 2.—Chassis of the Earl Car.

a tank fixed in front of the dash, it has a capacity of seven gallons, which is said to be sufficient for running about 350 miles. The water is circulated through the jacket by a pump, which is driven by friction off the flywheel and forces it through a finned radiator forming the front of the bonnet. A branch pipe from the circulation system is led up to the centre of the dashboard, and terminates in a pressure gauge showing whether the pump is working properly or not.

The petrol tank is fixed to the body beneath the front seat; it holds five gallons, which is sufficient for about 100 miles.

The main clutch is of the cone type and is formed inside the flywheel. The spring which normally holds it in engagement is enclosed in a sleeve fixed to the male member. A short coupling piece is introduced between the clutch and the gear box, so that the latter can be removed without disturbing the clutch after disconnecting the flanged joints. The fork which operates the clutch is carried by two steel pillars which project forward horizontally from the gear-box. The change-speed gear itself is constructed on Panhard lines, and gives three forward speeds and a "reverse," operated by a single lever. The second-motion shaft is arranged immediately above the first-motion shaft and the sliding gear wheels are upon the latter. The gear box is made in three pieces, and has a large cover-plate on top, with two small sliding shutters in it for introducing grease to the box. The shafts are carried in plain bearings. The third gear allows the car to travel at speeds of up to 40 miles an hour. The only unusual feature about the change gear is that the side lever has to be put in its furthest position forward to give the first speed, and in its extreme notch backward for the "reverse." The neutral notch is between that corresponding with the top speed and that for reversing. When starting the car, therefore, the lever is moved from the neutral position as far forward as it will go, and it is then brought back towards the driver in order to engage the second and third speeds consecutively. At first sight this appears to be inconvenient, and would doubtless be found so initially. There is no difficulty, however, in getting accustomed to it, and consideration will show that it is advantageous under certain conditions, and is as practical as the more ordinary arrangement.

The two halves of the countershaft are carried in self-aligning bearings on the frame, and these bearings have ring lubricators. A double acting band brake is mounted about the countershaft, close up to the gear box, and is operated by a foot pedal on the right of the steering pillar. The pedal to the left of the pillar is, as usual, that which withdraws the main clutch. These two and the accelerator pedal are neatly arranged with their fulcrums in line with one another.

The side chains are of the Brampton roller pattern, and can be tightened as usual by distant rods, connecting the back axle with the frame. The hubs of the rear wheels carry brake drums, upon which double acting brake bands are caused to press when applied by a side lever. These two brakes are compensated by a steel cable, and the fulcrum points of the bands are carried by rods which pass up to the frame. The steering gear is of the ordinary wheel type with worm and sector action for making it irreversible. Spring connections are introduced in the rods leading to the steering heads, and provision is made for taking up any "back-lash."

Two lubricators are fitted on the dash, the one on the right being of the pressure sight-feed type, in which the exhaust gases are employed to force the oil to the two cylinders and to the crank chamber. A larger lubricator on the left is connected by separate pipes with the bearings of the transmission gear and with those of the cam-gear on the engine. Separate grease boxes are provided for the clutch and the circulating pump.

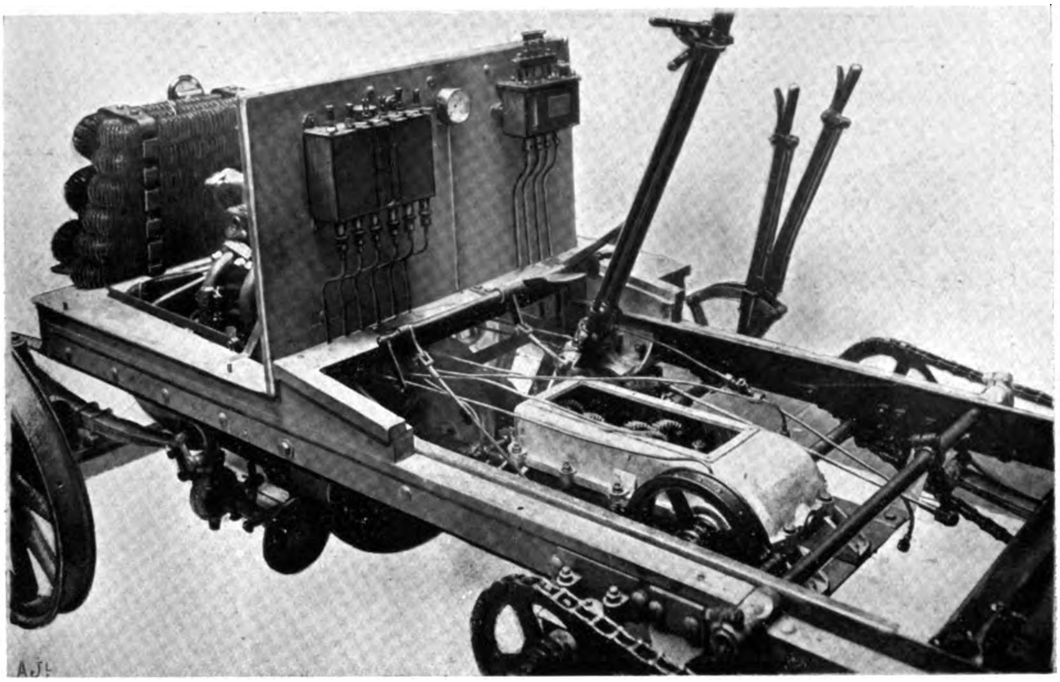


FIG. 3.—Chassis of the Earl Car.

This car appears to be well built throughout, and the materials employed are of good quality; it should prove a serviceable machine, and can, of course, be fitted with any desired type of body.

PARIS-MADRID.

THE Paris-Madrid Race was on Tuesday last authorised by the French Government.

The first stage for the speed entries for this very important event was reached on Monday last, when the list of entries totalled up to 232, although the entries do not officially close until May 15th. The balloting amongst these entrants for the order of starting took place on Monday. These figures compare with 171 total final entries for Paris-Berlin, and Paris-Vienna 218. Analysis of the entries shows that there are 96 heavy cars, 60 light cars, 39 voiturettes, and 37 motor bicycles, representing entrance fees amounting to 64,500 francs. Mons. Georges Prades has calculated upon a fairly moderate basis the value of all the entered cars, the total coming out at 6,421,000 francs. From week to week, as available, we have recorded the chief entries. The latest include 4 Charron-Girardot-Voigt cars, 6 Serpollets, 8 Georges-Richards, 8 De Dion Boutons, 4 Passy-Theliers, 3 F.I.A.T. cars, 4 Prosper-Lamberts, 4 Corres, 4 Hotchkiss, and two Chaboche. The Wolseley Tool and Motor Car Company (Limited), have also entered a car in the "heavies." E. H. Arnott is down to ride a Werner motor bicycle, and Foxhall Keene to drive a heavy car. Special events and a fête are to be organised at Bordeaux, by the Automobile Club Bordelais, on the day of arrival of the cars in that city.

As the result of the drawing for starting places, No. 1 has fallen to a De Dietrich heavy car, this company also drawing No. 5, No. 2 to the Panhard-Levassor house, No. 3 to Renault Frères, and No. 4 to a Decauville car. The first Mors car is No. 7, Georges-Richard No. 8; Mercedes, No. 14; De Dion-Bouton, 15; Prosper-Lambert, 20; Clement, 37; Pipe, 40; Darracq, 47; Charron-Girardot-Voigt, 53; Gladiator, 66; Gardner-Serpollet, 90; Gillet-Forest, 160. According to the list published by *L'Auto*, the four last numbers—232 to 235—curiously all fall to Clement cars, viz., 2 light cars, a voiturette, and a motorbicycle, by some coincidence the three last entries received at the Club being the three Clement vehicles which have drawn the last three numbers, viz., 233, 234, and 235. The Panhard team is divided between Nos. 2 and 224, the Mors between 7 and 217, all the 6 Mercedes being within 86. Three numbers have been annulled, viz., 107, 108, and 109. The first of the British entrants is Mr. E. H. Arnott with No. 84, on his Werner bicycle, Mr. S. F. Edge being close up with No. 89. Mr. Mark Mayhew is No. 138, Mr. C. Jarrott 176, the Wolseley Company No. 224, Mr. Hutton 216, and Mr. Holder 227. The American contingent has secured Nos. 114 (Mr. Foxhall Keene), and 123 (Mr. Gray Dinsmore). M. Henri Fournier comes in 83rd, and the first of the fair sex is Mdlle. du Gast, with 29, unless Madame Lockert is the driver of either Nos. 16, 19, or 28, the first three of the Ader group of cars. Allowing two minutes interval between the starting of each vehicle, about eight hours will be occupied in getting these cars away, and there are still three months during which entries can be received. Closing the final control at 3 a.m. the following day may, under these circumstances, prove to be rather hard upon some of the late starters.

The route which we published last week for the tourist section has been officially adopted by the A.C. de France.

THE GERMAIN ELECTRIC CHANGE-SPEED-GEAR.

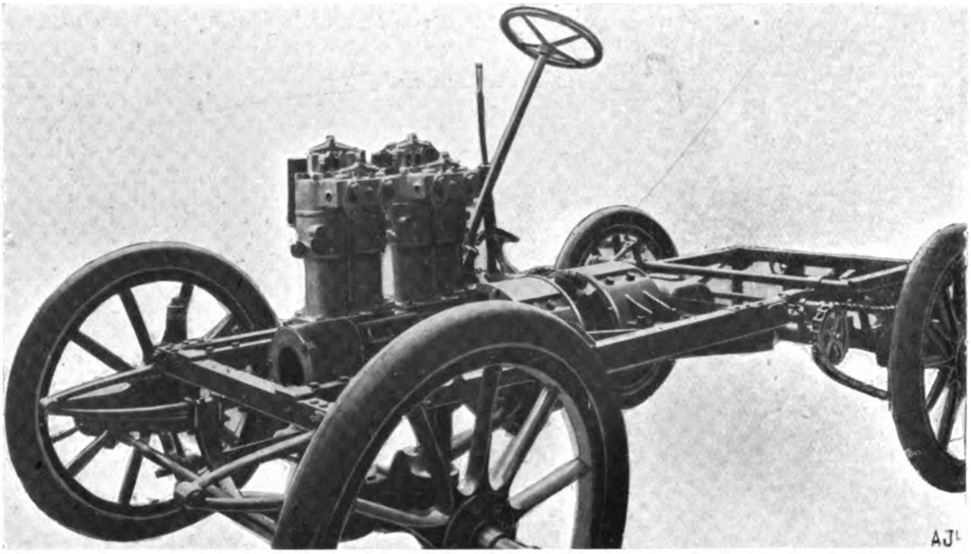


FIG. 1.—The Germain Chassis, fitted with Electrical Change-speed-Gear.

As we have before now pointed out that the direction in which improvement may be expected in the future in petrol-driven automobiles is in the suppression or radical change of the means now employed for transmitting the power from the engine to the road wheels. The change-speed gears used in the majority of present-day vehicles have never been regarded by engineers as a perfect mechanical apparatus for the purpose, and although it has proved itself to be one of those mechanisms which are far more satisfactory in practice than might be expected, yet the idea of sliding revolving gear-wheels in and out of mesh with one another produces a sensation to the mechanical mind which is somewhat akin to that caused by the scraping of a slate pencil across a slate. Those of our readers who are not sufficiently acquainted with existing motor car mechanisms to know the extraordinary capabilities of modern vehicles, in spite of these technical objections to the change-speed gears referred to, must not imagine that we are finding fault with the machinery now employed; and to them we would like to make it clear that although in this article we are considering the tendencies of designers towards greater perfection, yet it may be some considerable time before the real merits of any such apparent improvements have been confirmed by practical experience.

Although engineers have been agreed that the present mechanisms are far from being ideal, yet the difficulties of obtaining some suitable transmission mechanism without involving prohibitive complication, have been known to be so great that they have wisely devoted the greater part of their energy to bringing the present forms of change-speed gear up to their present high standard, and have realised that although vastly better systems *may* be available some day, yet it is a foolish policy to wait for the millennium.

Two systems, which may be regarded as possible directions of progress, particularly for certain kinds of road vehicles, have recently received a great amount of attention by those working on the problem. We refer to the combined petrol and electric system, and to the suppression of any change-speed gearing. In the former system the power is transmitted from the engine to the road wheels by converting it intermediately into an electric current, and in the latter the available power of the engine and its flexibility of output have to be enormously increased. At the present time we need only consider the first of these schemes, for the latter has not as yet made much practical progress, and is not so likely to be successfully developed in the near future, as there are many serious difficulties in the way.

We have already dealt very fully with those petrol-electric systems in which the engine drives the dynamo, and the current generated is utilised for driving electric motors coupled to the road wheels. Quite a large number of these have already been made, and we have reason to believe that many other manufacturers are at the present time busily engaged in the same direction. The systems employed differ a good deal in detail, but for the most part it may be said that the whole of the power generated by the engine is converted into electrical energy, and is in this form transmitted to the driving motors. The necessary apparatus invariably has two more or less inherent disadvantages, one being weight and the other cost. There are, however, other petrol-electric systems being developed, in which only part of the power generated by the engine is converted into electricity, and in which what might be called a direct-through-drive is obtained on the top speed. Such a system as this has recently been adopted by the well-known Germain Company, of Monceau-sur-Sambre (Belgium), and it cannot fail to attract the close attention of those who are interested in the metamorphosis of the petrol car, and in any inventions which may prove to be a connecting link in its development.

Before describing the Germain system in detail, it will be as well to point out a few of the chief relative advantages of devices of this kind and of the better known petrol-electric systems. So far as the flexibility between the engine and the road wheels is concerned, the same benefits are obtained, and in the matter of being able to vary the speed and torque of the driving wheels, without altering those of the engine, the same may be said. The advantages resulting from the employment of accumulators for storing surplus power and for giving increase of power for short periods are lost, but the weight of the apparatus involved is decreased, and the all-round efficiency of transmission, particularly on the top speed, is apparently superior.

The Germain Company's apparatus may be more correctly termed an electrical change-speed-gear than anything else, especially if the main clutch on an ordinary petrol car can be considered a part of the speed gear. It is shown diagrammatically in Fig. 2, and some of the electrical connections are represented in Fig. 3. The petrol engine, A, is fixed in its most usual position in front of the car, with its crank-shaft lying longitudinally. The power is ultimately transmitted by side chains to the rear wheels (also in precisely the usual way) from a transverse countershaft, G, provided with a differential gear. Two series-wound dynamos are placed between the engine and the countershaft, their armatures being in line with one another and with the crank-shaft. The two armatures are fixed upon a longitudinal shaft, at the rear end of which is a bevel wheel, F, which engages with a corresponding wheel on the shell of the differential gear. The foremost dynamo, which may be regarded as acting either as a dynamo or as a magnetic clutch, has its field magnet, B, fixed to the forward end of the crankshaft, so that it revolves at the same speed as the engine about its armature, C. The other dynamo acts for the most part as an electric motor, although it is also used as a dynamo in order to give a "braking" effect when required. The field magnet, E, is securely fixed to the main frame of the car, and its armature, D, revolves at all times at a proportional speed to the road-wheels. For the sake of clearness we shall refer to this latter dynamo as the motor, to the forward dynamo as a dynamo, and to the petrol engine as the engine.

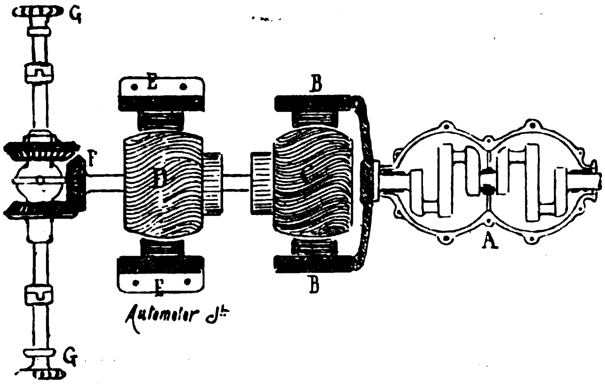


Fig. 2.—Diagrammatic Plan of Germain Electric Change-speed-gear.

It will be noticed that the field magnet, B, of the dynamo forms a fly-wheel for the engine; and it should be explained that each of the armatures are provided with separate commutators, from and to which the current can be taken through brushes in the ordinary way. Variations of speed of the car are effected entirely by a controller, which makes the necessary electric connections between the dynamo, the motor, and a variable resistance coil. The resistance, R, can be introduced across the terminals of the field magnet windings of the motor, and we have shown diagrammatically in Fig. 3, most of the switch connections which are necessary for giving the various speeds, although those for producing a braking effect are not included.

Assuming that the engine has been started, and that the car is at rest it will be noticed that the dynamo field magnets are revolving about its armature. At this time the electrical circuit throughout is open, and consequently no current is generated, and there is no tendency for the armature to revolve. When it is desired to start the car the dynamo is connected in series direct to the motor (switch not shown), and the current generated by the dynamo then flows in the direction shown by the arrows through the motor causing it to start in the same direction in which the engine is running. Under these conditions the car will travel at a speed which will depend upon the gradient of the road, and its tractive resistance. The power imparted to the driving wheels will be partly derived direct by the magnetic pull of the dynamo field magnets on its armature, and partly by the pull of the motor. The faster the car runs the more nearly will the speed of the dynamo armature correspond with that of its field magnets, and consequently the amount of current supplied by it to the motor will be less, and the motor will be doing less work. The reduction of current, however, also affects the pull of the dynamo field-magnets on its armature because the magnetism in both is thereby reduced. On the other hand, the slower the car runs the greater will be the relative speeds of the armature and the fields of the dynamo, and consequently the clutch effect between these parts will be increased, and the power of the motor will also be greater.

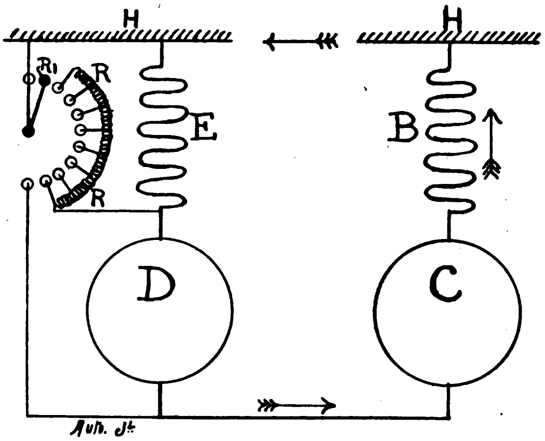


Fig. 3.—Diagram of Electrical Connections for Varying Speed.

For increasing the speed of the vehicle, the switch, R', is moved to its first position, thus introducing a resistance across the field magnets of the motor, and so increasing the normal speed of the motor in addition to increasing the quantity of current flowing through the main circuit, and hence the magnetic direct pull of the dynamo. Gradual increases of speed are made by reducing the value of the resistance, R, and thus gradually and ultimately, completely short-circuiting the motor field-magnets with greater and greater effect. In practice twelve of these resistance contacts are provided, equivalent to twelve different car speeds. For the top speed the switch, R', is moved to its lowest position in the diagram, when the entire motor is short-circuited, and consequently, it takes but little relative speed between the armature and the field-magnet of the dynamo to generate the necessary current for magnetising these two parts sufficiently to obtain a direct drive to the armature shaft. It should here be pointed out that this magnetic clutch provides an extraordinarily flexible coupling between the engine and the road-wheels, the effect of varying gradients on the road being merely to change the relative speeds of the field and the armature of the dynamo. It is, of course, obvious that there is a risk of the dynamo winding being burnt up if this top gear was switched in suddenly, or when climbing a steep hill, unless the output of the dynamo was sufficient to withstand the heavy overload.

Reversing is effected mechanically, and cannot be obtained by the electrical apparatus. The well-known method of bringing alternative bevel wheels on the differential into mesh on one side or the other of the bevel wheel, F, on the armature shaft, has been resorted to, this gear, of course, only being changed when the car is at a standstill.

A powerful electric brake, however, is available, and is operated in practice by the same controlling lever which gives the variations of speed. Four different degrees of retardation can be obtained, the handle being moved back over four contact pieces; the motor connections are so grouped, with variable resistances introduced, that the motor acts as a dynamo.

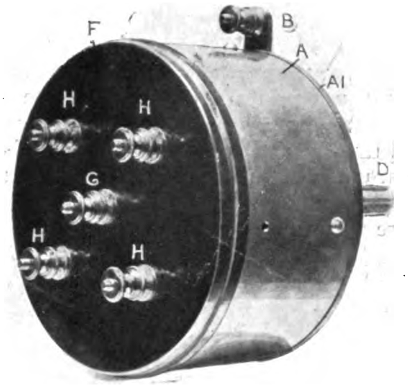
A chassis fitted with this apparatus was shown for the first time at the Automobile Exhibition which has recently taken place in Brussels. We have not as yet been able to obtain any very full constructional details from the makers, but hope to do so shortly. A photograph of the chassis referred to is however reproduced in Fig. 1, and is interesting, so far as it goes.

The same manufacturers have also shown their progressiveness in another direction recently, and have taken up a magneto system of ignition devised by Herr Eisemann, of Stuttgart. This system differs considerably from the majority of those now in use, for the magneto itself is fixed on the dash, in full view of the driver, and the ordinary high-tension ignition plugs are employed. The magneto is of the rotary type, and the windings are normally short-circuited. Its spindle carries a cam, which breaks the closed circuit at the moments of maximum induction. The disruptive current thus produced is sent through a coil of special construction, which has no trembler. The high-tension current thus produced is alternately transmitted to the plug in each cylinder by a commutator, which forms part of the magneto mechanism itself. The coil lies close to the magneto, and in consequence the electrical connections are short. We understand that a single magneto and coil can be used for any number of cylinders.

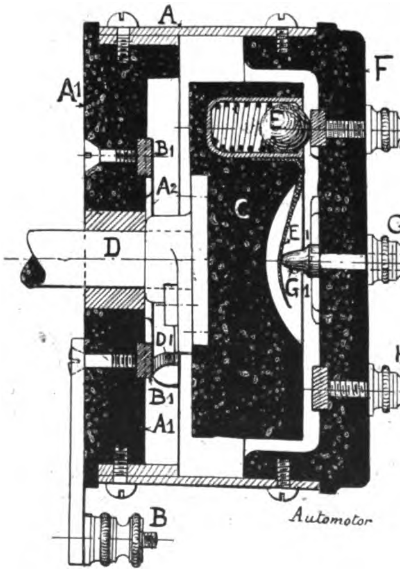
A PRIVATE testing track is being constructed by the Wolseley Tool and Motor Car Company, Limited, on a large plot of ground facing their Adderley Park Works. This area covers nearly 8 acres, and will ultimately be taken in for erecting additional factories for the daily increasing business of the Company. The idea, therefore, of utilising the space in the meantime for a testing track is distinctly clever, as it will enable the Company to try the paces of each car before sending out, without fear of the intervention of the arm of the law for exceeding the speed limit, one or two sharp gradients occurring in the run, one short strip giving a rise of as much as 1 in 5. The track comprises two laps to the mile, and has just received the finishing touches from the steam roller. When not in use for testing the Company's cars, arrangements will be made for servants of the Wolseley Company's clients to be taught to manipulate the cars before launching them on the high roads with only a half-formed idea of the capabilities of the machinery.

THE BLAKE COMMUTATOR.

MR. F. C. BLAKE, of Hammersmith, has recently brought out a new commutator which is specially designed to ensure that the ignition in all the cylinders of a multi-cylinder petrol engine shall occur at precisely the same corresponding moments in the cycle of operations of each. In this device a single coil is employed, and the high-tension current from it is alternately switched on to each of the plugs in turn. One of these mechanisms, constructed for a 4-cylinder motor, is shown in our illustrations. It is intended to be fixed to the dashboard of the car, and to be driven at half-speed from the engine by a chain. Not only is the high-tension current commuted from plug to plug as the commutator revolves, but the primary circuit to the induction coil is also made and broken four times during each revolution of its shaft. This additional provision is made with two objects in view, the one being to save current, and the other to prevent any high-tension spark from passing across inside the commutator. The primary circuit is therefore made after the secondary has been completed, and is broken before the secondary circuit.

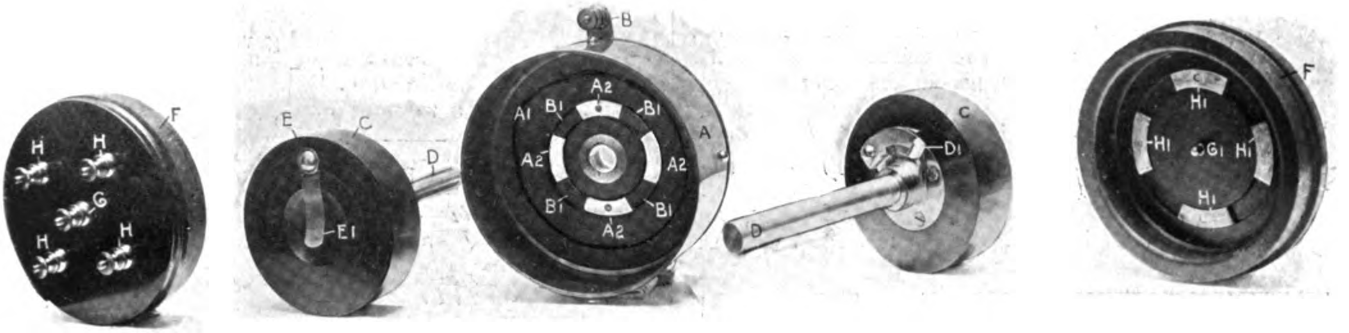


The Blake Commutator.



Section through Blake Commutator.

Referring to our illustrations, it will be seen that the whole apparatus is enclosed by a circular metal case, A, having a cover, F. In other figures both sides of the removed cover, F, are seen, and the rotating contact block, C, with its driving shaft, D, is also shown separately in two different positions. The metal case, A, fits over a fibre base, A^1, and carries a concentric metal ring with projecting contact faces, B^1. This ring is in electrical connection with the external terminal, B, and the spaces between the contact faces, B^1, are filled up with small fibre blocks, A^2. The revolving contact-piece, D^1, is mounted on one side of an ebonite block, C, and the shaft, D, is in electrical connection with it; this contact-piece presses against the fixed contacts, B^1, already referred to, and thereby allows the primary current to flow from the terminal, B, through them to the shaft, D, and thence through its bearing back to the battery.



THE BLAKE COMMUTATOR.

Front of Cover. Front of Revolving Contact Disc. Interior of Casing. Back of Revolving Contact Disc. Inside View of Cover.

The other side of the ebonite block, C, is fitted with a small steel ball, which is held up against a retaining ring by an internal spring. The steel ball makes contact with metal plates, H^1, which are fixed to the inner faces of the ebonite cover, F. A steel spring, E^1, which also makes contact with the ball, E, presses against a central pin, G^1, in the cover, F. The blocks, H^1, are held in place by external terminals, H, and the pin, G^1, is the inner end of the central terminal, G. As the block, C revolves, the spring, E, conducts the high-tension current from the terminal, G, through the steel ball, E, to each of the blocks, H^1, in succession, and, therefore, to each of the terminals, H, in turn. The insulated high-tension wire from the coil is led to the terminal, G, and separate wires pass from each of the terminals, H, to the respective ignition plugs of the cylinders. The fixed contact pieces, B^1 and H^1, are so arranged in relationship to the moving contact pieces, D^1 and E, that the high-tension connections are made just before the low-tension circuit is completed to the primary terminals of the induction coil. The coil employed has its own trembler. The apparatus is extremely well made and is being given a trial by several makers of cars.

WHAT is "Durability"? The Secretary of the Dunlop Pneumatic Tyre Company, Limited, writes us as follows *re* the Automobile Club Tyre Trials:—

> "The main durability question was solved by all the tyres which finished the 4,000 miles, but the *relative durability* of the tyres has never been solved, and the proposal of my Company to the Automobile Club, that the tyres should run until they were destroyed, was unfortunately not accepted.
>
> This would have been the only real test of 'relative durability,' and as we have said, it has not—contrary to our wish—been applied.
>
> Having regard to the fact that the Trial was to test '*pneumatic* tyres, genuine road punctures—which are distributed according to the fortune of war—should not be counted against durability. As a matter of fact, the Dunlop car driven by Mr. Mosses, finished the whole of the original trial of 3,000 miles without any puncture whatever—the only authentic record for non-puncture over 3,000 miles. The Dunlop tyres in the last Gordon-Bennett race finished without any puncture whatever.
>
> Further, the four sets of Dunlop tyres entered in this test were identical in quality, but some of them picked up more nails on the road than others, so that the placing of one set of our tyres before the others was purely a matter of chance and, therefore, we say the method adopted by the Judges in testing the relative (and not the general) durability of the tyres was ineffective.
>
> On the other points of the 'absorption of vibration' and 'tractive efficiency,' the judgment was necessarily based on scientific conclusions, and on such conclusions true pneumatic tyres must prove their superiority. The object of this letter is to point out that the results of these trials were never in doubt when scientific points were considered, but on the other hand they were considerably jeopardised when punctures were counted against true pneumatic tyres, especially constructed to absorb vibration, to give tractive efficiency, and to be easily repaired. If these actors be left out of consideration, then my Company could produce tyres guaranteed to travel 6,000 to 10,000 miles without any puncture at all, under the conditions of the late trial."

THERE is a gentleman in the neighbourhood of Canne of the name of Emile Fabre, the guardian of the Cannes Golf Club. He evidently has a future before him, and must be a man of singular resource and *aplomb*. While riding his bicycle on Tuesday last not far from Cannes he had the misfortune (or was it the good fortune?) to collide with a motor car. The shock was a violent one, and M. Fabre was observed to be soaring skywards at an acute angle and high speed, but with his imperturbability unruffled—a heroism reminiscent of the best and greatest traditions of France. So little were his self-control and command of his faculties interfered with by the accident, that, though his bicycle was smashed to smithereens, he himself had the address to descend into the motor car and assume the vacant seat by the driver's side. We are not astonished that the driver instantaneously stopped. Probably he received a greater shock than M. Fabre. The effect on the bystanders (there are always bystanders on these occasions) was tremendous. According to their account M. Fabre absolutely disappeared from view, and while they were inspecting the ruins of his bicycle they saw him descend—a veritable *Deus ex machina*—from the car. Whatever may be the future of M. Fabre—and after such an occurrence doubtless he must have felt like Clive reserved for something great—whether he devotes his days to cycling or the guardianship of golf clubs, there is evidently one line in which his future would be assured. He should make a journalist whose fame would eclipse even that of the late M. de Blowitz.

THE NEW 14-H.P. BROOKE ENGINE AND GOVERNOR-CARBURETTOR.

THE new 14-h.p. light car which is being built by Messrs. J. W. Brooke and Co., of Lowestoft, has already been referred to in our columns, and although not completed in time for the recent exhibition at the Crystal Palace, will, we understand, be on view at the forthcoming Show at the Agricultural Hall next month. The engine was shown at the Palace, and is represented in Fig. 1. It is of the 3-cylinder type, and has mechanically-operated inlet-valves placed on the same side of the combustion chamber as the exhaust valves, with which they are interchangeable. The valve spindles are seen in the illustration, and it will be noticed that they are all operated by cams on the same half-speed shaft. A single cylinder casting is used, and an aluminium cover forms the top of the water-jacket above the cylinders. Separate exhaust pipes are led from each cylinder, and the ignition plugs project horizontally from the valve-chambers. Inspection covers are provided above each valve, and are held in place by lock-nutted set-screws, which pass through a single yoke bar bridging across them all, and hinged to the cylinder casting at each end. The crank chamber is, as in the former Brooke engines, made in three pieces; the central carries the crank-shaft bearings, and is secured to the upper portion independently of the base, so that the base can be removed without disturbing any moving parts.

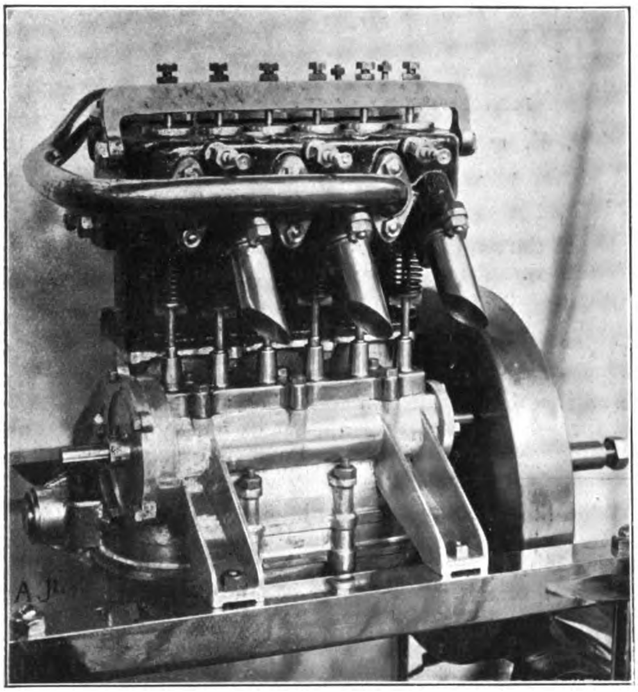


FIG. 1.—The new 14-h.p. Brooke Engine.

In the new light car this engine is fixed longitudinally beneath the bonnet in front, instead of having its crankshaft lying transversely as hitherto. The power is transmitted through a friction clutch, formed in the flywheel to the gear box, and from the gear box by side chains to both the rear wheels. We are at present unable to say more than this concerning the vehicle, but shall give a full description of it as soon as we have made a thorough inspection, and have given it a practical trial.

It will be remembered that the automatic governor hitherto employed for regulating the speed of the Brooke engines was of a radically different construction to that employed on the majority of petrol motors, and that it was operated by the pressure of the exhaust gases in the exhaust pipe, and not by any mechanically-driven or centrifugal device. The new combined governor and carburettor is shown sectionally and in plan in Fig. 2. By this device the speed of the engine is controlled by the suction of the piston. It is well-known that the pressure in the mixing chamber of a carburettor becomes less than that of the atmosphere when the engine is working, and that the degree of vacuum produced increases with the engine speed.

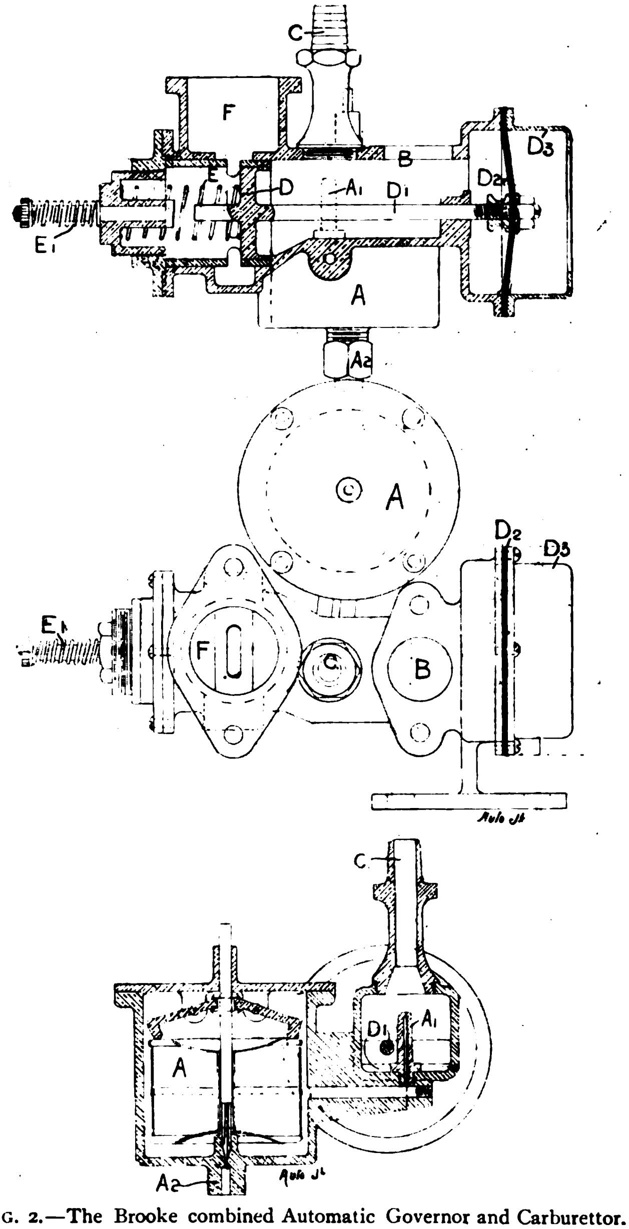


FIG. 2.—The Brooke combined Automatic Governor and Carburettor. Longitudinal section, plan, and transverse section.

This fact constitutes the underlying principle upon which the new apparatus is based.

Referring to the drawings, A is a float feed chamber of much the usual type, into which the petrol is led through the pipe, A^2. From this chamber it is led to a spray nozzle, A^1, in the mixing chamber, where it is taken up and mixed with the main air supply entering through the pipe connection, B. This air is as usual conducted to the mixing chamber by a pipe leading from the neighbourhood of the warm exhaust pipes. The mixture passes to the engine through the pipe, F, and is regulated by a throttle valve, D. The valve, D, is formed by a cylindrical sleeve which fits inside a tubular bush, having slots cut through it. The sliding sleeve is carried by arms upon a rod, D^1, which at its other end is secured to the centre of a diaphragm, D^2. The throttle valve is normally held open by a spring, E. The diaphragm is held in place around its circumference by the cover, D^3, which is open at its centre. As the speed of the engine increases, and the pressure in the mixing chamber falls, the atmospheric pressure acting upon the diaphragm, D^2, closes the throttle valve, D, and the normal speed of the engine therefore depends upon the strength of the spring, E. For running at the higher speeds, the action of the governor can be suspended by the driver, a foot pedal being provided for this purpose is connected with the sliding pin, E^1. The pedal forces it inwards against the action of its external spring so that it comes into contact with the valve spindle, D^1, and holds the throttle valve open. At high speeds, also, an auxiliary supply of cool air can be admitted through the pipe, C, which is connected with a shutter on the dashboard by a rubber pipe. This auxiliary air supply enables the richness of the mixture to be reduced when the additional degree of suction produces an excessive flow of petrol. The apparatus has been found to work extremely well, and is certainly very simple. One of the chief advantages obtained by its use is that it can be placed in any desired position, irrespective of the design of other parts of the engine, or can be employed on any existing motor.

Dunlop tyres were fitted to 563 wheels at the Crystal Palace Automobile Show.

Attempts to cover long distances under exceptionally trying conditions and in the shortest possible time are continuously made by automobilists mainly, in each case, with a view to demonstrating the reliance which can be placed upon some particular make of car. Mr. J. W. Stocks has several times accomplished some good records in this respect, and last week, taking advantage of the fact that he was attending the Edinburgh Automobile Show, he arranged to take up by road a 6 and an 8-h.p. standard De Dion Bouton car, instead of sending them by train. He started on the 11th instant at 7.35. accompanied by Mr. J. S. Matthews, a member of the Scottish Automobile Club. The two cars reached Grantham, 111 miles, at 1.20 p.m.; Doncaster, 163 miles, at 5 o'clock; and York, 200 miles, at 7.55 p.m. Leaving York at 7.45 a.m. the next morning, they reached Newcastle, 282 miles, at 11.45 a.m.; and Edinburgh, 404 miles, at 9 o'clock the same night. The nett time from London to Edinburgh was 22 hours 40 mins. This twin performance should prove an excellent testimonial for country work, particularly for the lower-powered car, which only weighs 7 cwt. complete.

The arrangements for the Commercial Vehicle Trials being organised by the A.C. of America are maturing. The contest will probably take place in May, and will be of three days' duration. A great portion of the course is to be arranged through the crowded streets of New York in order to demonstrate the practicability of commercial vehicles for ordinary everyday work.

Final points in connection with the Fournier-Winton series of three races, which we announced as far back as January 17th, are to hand, and confirm the particulars already published by us. The first will be held on July 25th at the Empire track, Yonkers, N.Y., the second between August 1st and 12th on the Glenville track, Cleveland, Ohio. Each is to be 25 miles from a standing start, and in the event of a tie a third race is to take place on the track on which the fastest time is made in the two previous races. Should an accident happen to either machine in the first mile in either of the races the race shall be stopped and restarted.

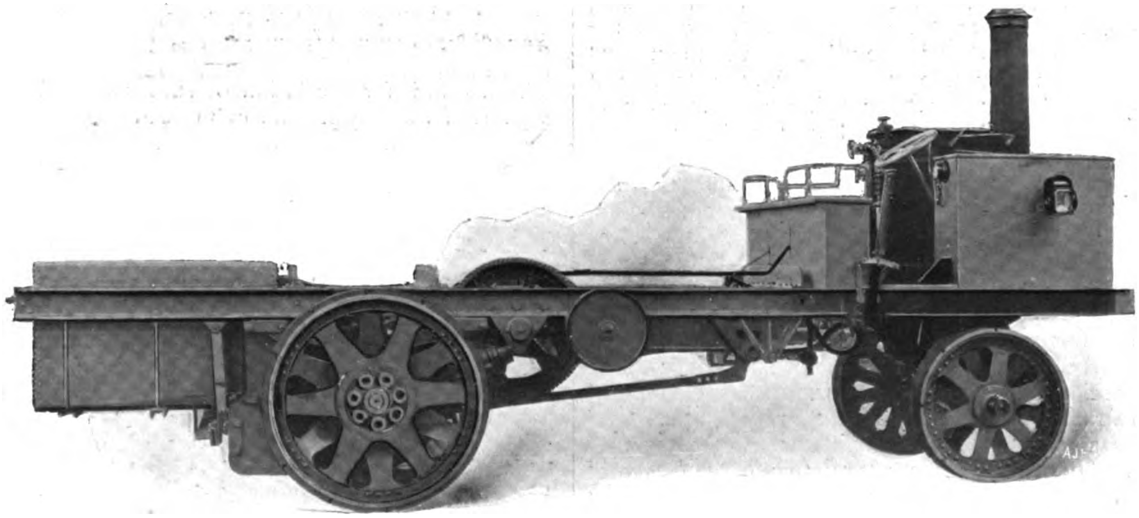
The awards for decoration of stands and elegance and comfort of vehicles in connection with the Brussels Salon are announced. Stand decoration: 1st prize, "Belgica." Elegance and comfort of vehicles: Class A—open voiturettes, 1st prize, "Vivinus" (electric vehicle); 2nd, Mathieu. Class B—closed voiturettes, 1st, F. N.; 2nd, Passy-Thelier. Class C—open cars, 1st, Pipe car; 2nd, Germain car. Class D—closed cars, 1st, Germain; 2nd, Gobron. Class E—open convertible voiturettes, 1st, Wilford. Class F—closed convertible voiturettes, 1st and 2nd, Gobron. Class G, commercial vehicles, 1st, "Belgica"; 2nd, F. N. Class H—wagons, 1st, Gobron; 2nd, Germain.

The prohibition of the big road race announced for the Nice Week has necessitated alterations in the programme. The following is the order of events as now arranged:—March 26th, the heavy vehicle competitors arrive from Paris at Pioule, where members of the Nice Club will meet the cars. March 27th, Club and competitors run from Pioule to Nice; 28th, a Brake Competition; 29th, *Corso Fleuri;* 30th and 31st, Tourist Car Competition and test of efficiency on the rim. April 1st, Turbie Hill Climb; 2nd, Appearance Competition at Monte Carlo; 3rd and 4th, Nice Exhibition; 5th, Kilometre and Mile Record Trials on the Promenade des Anglais (H. de Rothschild Cup); 6th, Speed Kilometre on Turbie Hill (coupe de Caters).

The Fuel Consumption Trials organised by *L'Auto* started on Thursday last, over fifty entries being received. The classing will be firstly, by categories according to weight, and secondly, by ton-kilometre. A number of general prizes are offered, and each category has allotted to it one medal for the first vehicle using alcohol as fuel, whilst an industrial prize of honour is offered to the group of three vehicles coming out best in the ton-kilometre classing. Special prizes are also offered for the carburettor, the fuel, and the driver of the winning vehicle in this classing. These are all in addition to the general prizes in each category. Finally, an extra prize is offered by our contemporary, *La Locomotion*, to the first car classed amongst the first five, which shall be an ordinary standard vehicle, and not in any way altered with special regard to the conditions of this trial.

THE AUTOMOBILE SHOW AT THE CRYSTAL PALACE.—PART III.

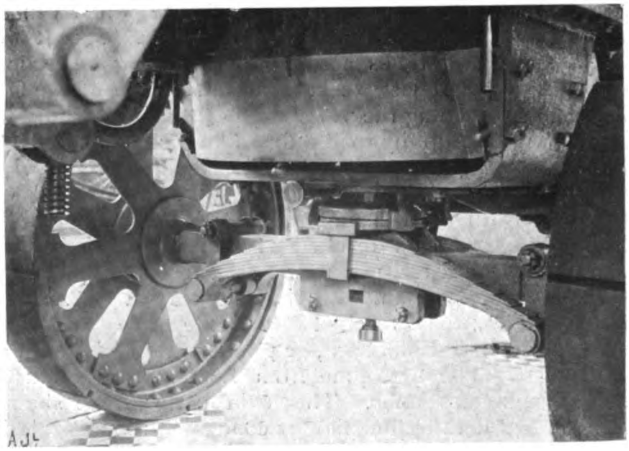
Several petrol cars of American construction were on view on the stalls of different exhibitors. The Duryea Company, as usual, had quite a large exhibit, and the popular little Oldsmobiles were again well to the fore. A new carburettor is now used on them, and both axles are stiffened by stays. A chassis, with the cylinder and valve chamber cut through, well demonstrated the simplicity of the moving parts of the driving mechanism. A particularly interesting newcomer was the 20-h.p. Winton, also shown by the Anglo-American Motor Car Company. The main frame is built up of sheet and angle steel rivetted together. The engine is of the 2-cylinder "balanced" horizontal type, and is placed to one side of the frame about midway between the front and rear axles.



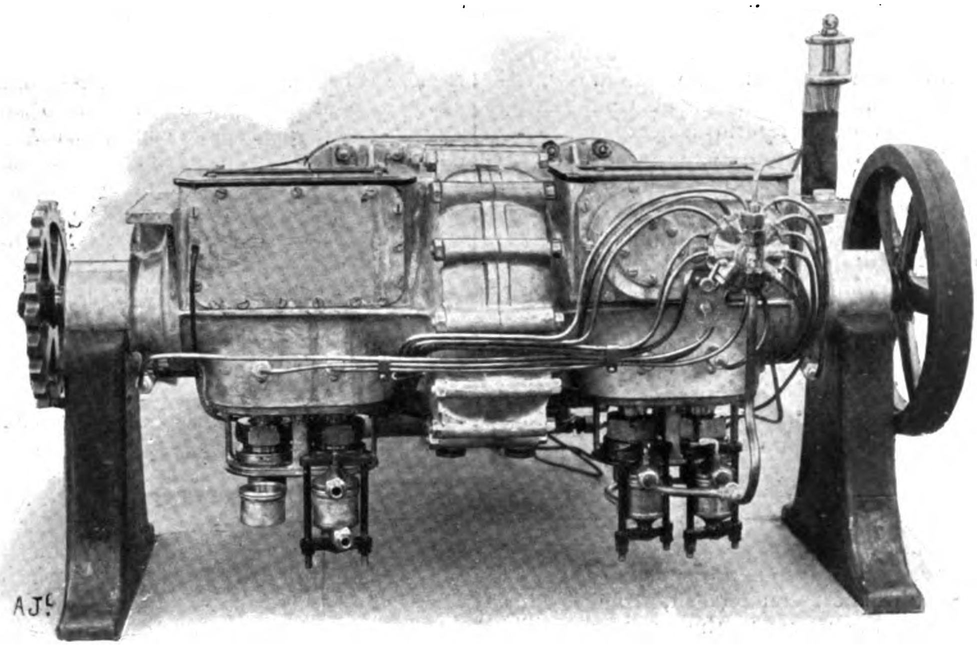
The Straker 7-ton Lurry.

The cylinders are enclosed in large jackets which may almost be regarded as small water tanks. The crank-shaft lies transversely across the frame, and is in line with the first-motion shaft of the gearing, enclosed in a gear-box. A main clutch, of the disc friction type, is employed to connect the crank-shaft with this gear-shaft. The flywheel forms part of this main clutch, and the clutch is operated by a sliding cone on the shaft, which causes pivotted levers to force the friction surfaces together.

A sleeve carrying a sprocket wheel rides freely on the projecting end of the first-motion-shaft outside the gear-box, between it and the clutch. The power is transmitted from the sprocket by a single central chain to the live-rear-axle. The top gear is obtained by clutching the sprocket direct to the first-motion shaft. The gear-box also contains a short lay-shaft, parallel with the first-motion shaft, and in the same horizontal plane as it; the one end of the lay-shaft has a spur wheel fixed to it which at all times meshes with a corresponding wheel on the sprocket sleeve; it also carries two wheels of unequal size which mesh with corresponding wheels on the first-motion shaft, either of which can be clutched rigidly to the shaft in order to obtain the first and second speeds respectively. The gearing runs in oil, and is controlled by two separate levers. The high speed lever is drawn towards the driver from a central position to obtain the third speed, and is so arranged that when moved forward it applies a brake on this sprocket sleeve above referred to. Side brakes acting on the hubs of the rear wheels are also provided, and are applied by a foot-pedal. The speed of the engine is regulated by a pneumatic device, in which air is forced behind a piston which throttles the ingoing mixture. As the engine runs faster the air pressure behind the piston increases, and consequently the desired speed is automatically maintained. The variations of speed are effected by means of a by-pass valve on the air pipe; this valve is gradually opened wider and wider as the accelerator-pedal is depressed. It can be entirely closed by a small handle fitted in the body, and when closed it stops the engine. The handle can only open the by-pass valve sufficiently to allow the engine to run at a very low speed, the higher speeds required when driving the car being obtained entirely by means of the foot-pedal. The



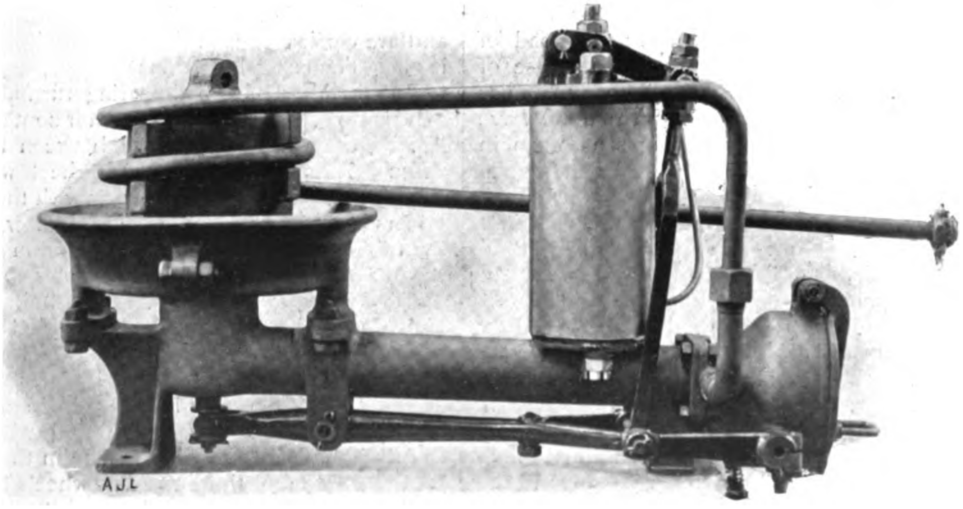
The Straker Front Axle Suspension.



End view of the Clarkson Engine and Differential Counter-shaft.

carburettor employed is of the surface type, and is of very neat construction. The engine is lubricated by pipes leading from a small tank above the crank chamber, and the flow of oil to this tank from the main reservoir is controlled by a float feed device. All the supply tanks are arranged beneath the bonnet, and a multitubular cooler, as also a large drawer for carrying the tools, are fitted in front. The starting handle, which is removable, can only be inserted in place after the time of ignition has been retarded, thus preventing any risk of back firing when using it. The vehicle is fitted with a roomy tonneau body constructed of wood, and continuous mud-guards are fitted at each side of the car.

The Petrol Power Company showed two Rambler runabouts and one chassis, these are now fitted with a Longuemare carburettor and the bore of the cylinder has been increased to 5 inches. The capacity of the cooling water tank has also been increased by about a third. It is of the same multitubular construction, and is provided with an air scoop as before. The wheel base is now 6 feet 6 inches, a roller bearing takes the extreme end of the crank-shaft, wooden wheels are fitted, and double-tube tyres are employed. The same company also exhibited an 18-h.p. twin-cylinder Peerless car, which we briefly described recently in connection with the Exhibition at Earl's Court. The car shown was the second one which has reached this country, and had a fan-cooled radiator in front of the bonnet. We understand that the Peerless Company are now making



The Clarkson Paraffin Burner.

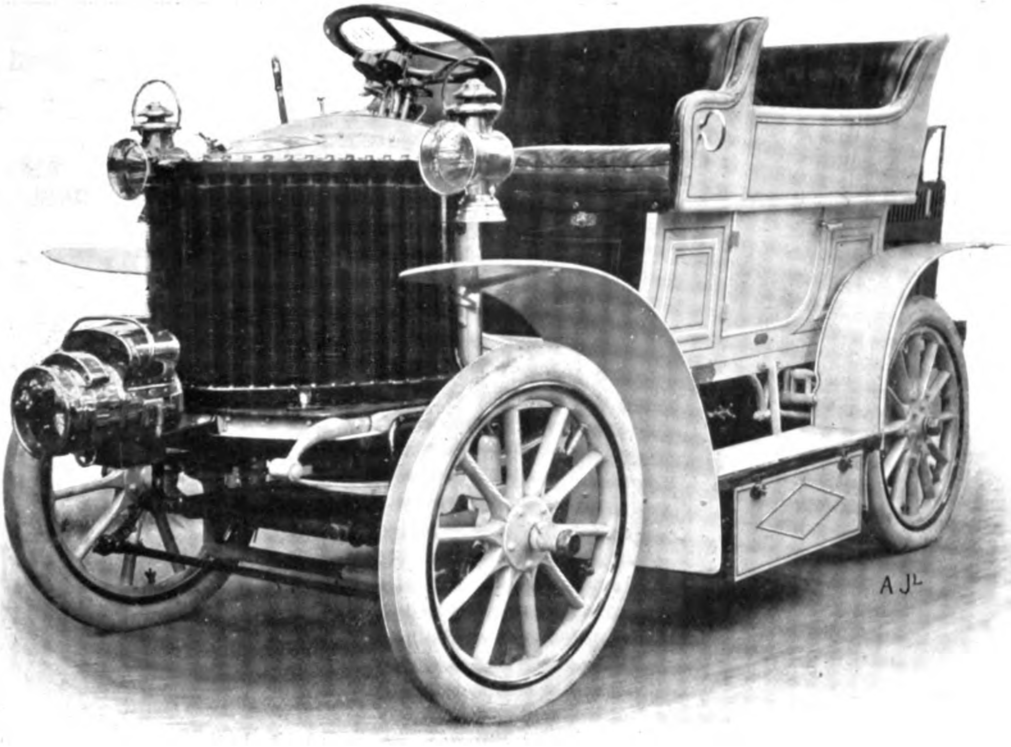
4-cylinder models on Mercedes lines, and are adopting stamped steel main frames.

The Kitto Automobile Company showed a useful new light vehicle of American construction, which was fitted with a body having an ingeniously arranged disappearing rear seat. When folded down it forms a neat back to the car, and when in use gives comfortable extra seating accommodation. The frame is constructed of 1½-inch angle iron, welded at the corners, and mounted upon elliptical side-springs front and rear. The axles are tubular, and are stiffened with trusses; the rear axle has roller bearings, and is of the live type. The wheel base is 6 feet 6 inches and the track 4 feet 8 inches. The wheels, which are 28 inches in diameter, are made of wood, and are fitted with double-tube pneumatic tyres. The engine develops 8-h.p., and has two vertical cylinders with a bore of 3½ inches and a stroke of 3½ inches. Each cylinder is a separate casting, complete with water-jacket and head. High-tension ignition is employed, and a float feed carburettor is used. The change-speed gear is of the ordinary sliding gear type, and is connected with the crank-shaft through a cone friction clutch; it provides three forward speeds and a reverse, a direct through-drive being obtained on the top speed to the short countershaft, from which a single chain transmits the power to the back axle. The water and fuel tanks are placed beneath the front seat, and are readily accessible by hinging the seat up forward. The tanks are made of copper, and have capacities of about 5 and 4 gallons for the petrol and water, respectively. The steering gear is of the wheel type, with inclined pillar. The change-speed lever is mounted on the steering pillar, and the small levers regulating the time of ignition and the throttle valve are also fixed beneath the steering wheel. We understand that two side chains are to be substituted for the single chain in future models. The car is being put on the market at a very reasonable price.

Amongst other small petrol runabouts of American construction, based upon the well-known lines of the Oldsmobile, we noticed the "Northern" and the "Oilmobile" little cars, the former was shown by Joseph Cockshoot and Co., of Manchester, and the latter was again to be seen on the stall of the English Motor Company.

The Thornycroft Steam Wagon Company showed some excellent examples of their well known heavy steam trucks, including a three-ton dray specially constructed for brewery use and intended to haul a trailer with a further load of two tons, and a standard tipping wagon for the use of municipal authorities. These machines are already familiar to our readers, both from the descriptions which we have given from time to time, and from having seen them in many parts of the country in actual use. The special vehicle shown was a lurry designed for colonial use, and provided with an extra large boiler which enables inferior fuel to be employed where good coal is unobtainable.

The Straker Steam Vehicle Company showed several of their latest wagons, including one 5-ton chassis and one 7-ton chassis. The 5-ton vehicles are intended to draw trailers with loads of an additional two tons, and the larger hauls a 3-ton trailer. The general arrangement of parts in both vehicles is similar, and they are well and strongly constructed. The main frame is built of strong channel steel, stiffened with cross-members, and an additional longitudinal member passes from a cross-member just behind the cab to another just in front of the back-axle. The engine is fixed in a horizontal position between this longitudinal member and the left-side member of the frame. The cylinders lie forward, and the crank-shaft projects across the frame outside the crank-chamber. It here carries two pinions, either of which can alternatively be slid along the shaft into mesh with corresponding spur wheels on a countershaft. The countershaft is carried in bearings fixed to the inner longitudinal member and to the right side member of the frame. The power is transmitted from this countershaft to the live rear axle by a special anti-friction chain of great strength. The chain is of the double-roller Brampton type; for the large vehicles it is tested to thirty tons, and for the smaller lurries to twenty tons. The engine is of the double-acting compound type, and has a neat single-eccentric reversing gear, in which a square block slides in a slot in the eccentric block; the eccentrics for the two cylinders are controlled simultaneously. The engine on the large wagon indicates 40-h.p. The wheel base is 11 ft. 6 ins., the track of the rear wheels is 5 ft. 3 ins., and that of the front wheels 4 ft. 6 ins. The overall length is 21 ft. 6 ins., and the water tank, which is carried in the rear of the frame, has a capacity of 200 gals. In the Straker wagons the feed-water pump is driven at a low speed through spur gearing off the left-hand end of the crank-shaft, and it is readily accessible from the outside of the machine. The engines are entirely enclosed, and provision is made for admitting high-pressure steam to the low-pressure cylinders when necessary. The rear axle is so made that the differential gear can be locked when necessary, this being done by inserting a pin through one or other of a series of holes arranged in the hub of the right-hand wheel. A central solid axle passes across from the outside of one hub to the outside of the other, and this is rigid with the left-hand wheel, and with a disc outside the hub of the right wheel. The right-hand wheel itself is connected by a sleeve with the differential gear; the sleeve runs freely about the solid axle. The pin above referred to is inserted through corresponding holes in the disc on the solid shaft and in the hub of the road wheel. The method of suspension employed in front is interesting, and is well shown in one of our illustrations. The suspension at the rear is by semi-elliptic side-springs, the ends of which are free to slide on guides on the frame. Two transverse inverted springs form the front suspension. They lie in front and behind the axle, and are carried at each end by swinging links from the axle itself. The central portions of the springs are fixed to the under member of a ball-bearing turntable, and the front axle is pivoted centrally by a horizontal pin and is also capable of vertical movement between horn-plates. The vehicle is steered by a hand wheel which is connected through bevel and worm gearing with the turntable. The boilers employed resemble the well-known De Dion model; the tubes which connect the two annular spaces together are of large diameter, and each water space is strengthened by stays passing through it. The boiler is fixed centrally above the turntable, and is provided with all the usual modern fittings. The road wheels on these lurries are built up of stamped steel plates with flanged rims, and although on the larger vehicle shown the spokes formed by the two plates interlaced with one another, yet in future these wheels will be made in the same way as those on the five-ton machines. The wheels have a more simple appearance, and, being made of a less number of pieces, are stronger and more durable; the treads of the tyres are

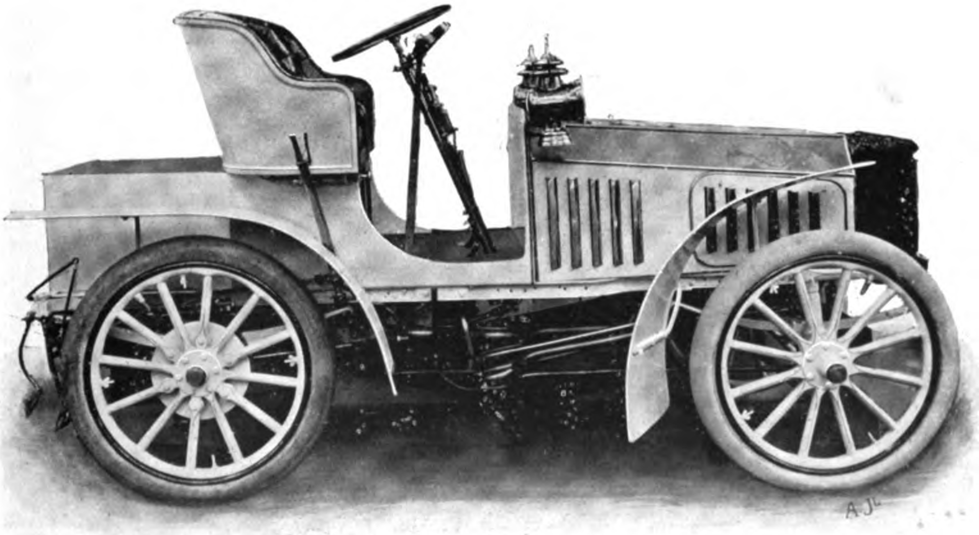


The Speedwell Company's 20-h.p. Gardner-Serpollet Car.

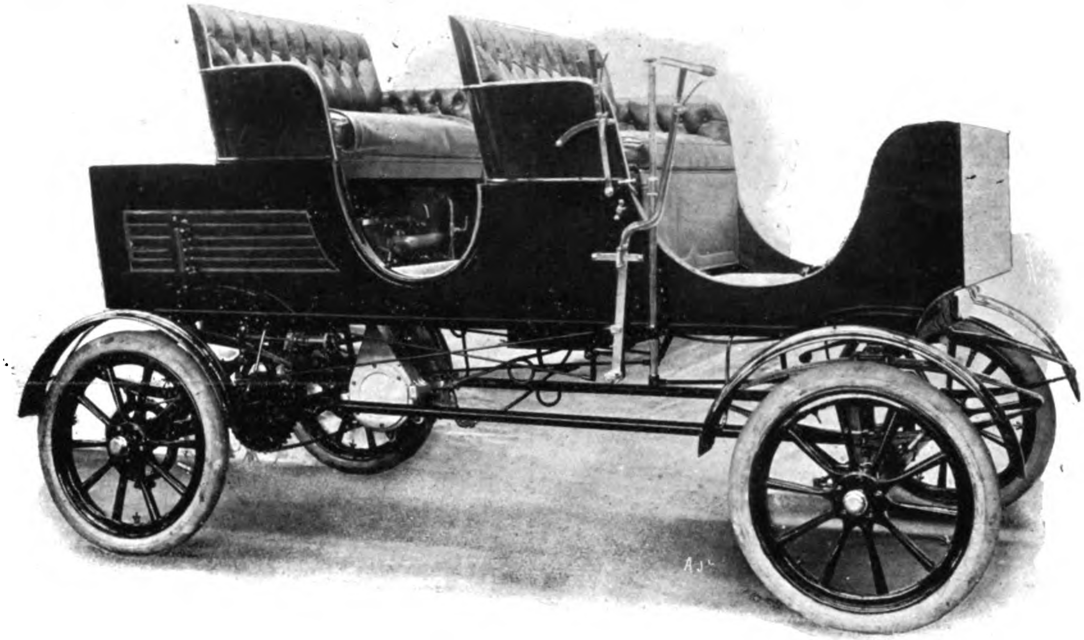
formed with cross grooves in them, and have been found to ensure adhesion to the road.

Jesse Ellis and Co., Limited, showed samples of their special steam wagons, which are constructed to carry loads of from 4 to 5 tons, and to haul a trailer with an additional load of 2 tons. They are of strong construction, and are fitted with steel gearing providing speeds of three and five miles an hour. The engine is of the horizontal compound type, and the boiler is of the water tube type, both of these parts being carried upon a special frame, which is connected with the two axles.

The Chelmsford Steam touring car, which we described in our issues of the 8th, 15th, and 22nd November last, was shown by Clarkson, Limited, on their stall. The

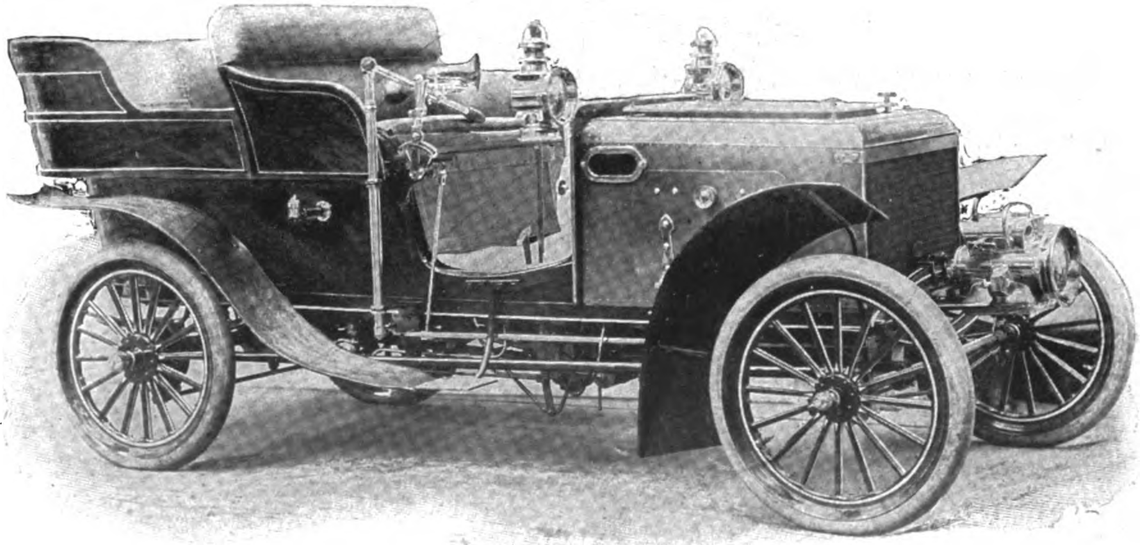


The Speedwell Company's 10-h.p. Gardner-Serpollet Car.



A Vapomobile Steam Car.

vehicle has recently been raised slightly higher on its springs in order to give greater clearance between the mechanism and the road. The engine was shown separately, and has been equipped with Mr. Clarkson's special system of oil distribution which was dealt with in a paper read by him at the Automobile Club (see page 159). A view of this engine is seen in one of our illustrations where the distributor, which is driven by spiral gearing, together with the delivery pipes leading from it to the various parts will be recognised. The force-pumps beneath the differential countershaft are clearly shown, and it will be seen that a pulley wheel is fitted in place of one of the outside sprockets to enable the mechanism to be set in motion on the stall by an electric motor through a belt. The crank chamber doors were taken off and glass doors substituted for them. The engine was kept in motion and the effectiveness of the oil feeding arrangements well demonstrated. Small electric lamps were fixed inside the crank chamber to illuminate it thoroughly. The Company also showed a new body of very convenient design adopted for use on their chassis; and they also exhibited a one-ton business van body for it. The finished car was fitted with



The Albany-Lamplough Steam Car.

American-made tyres, which we have not before seen, and which are known as the "Bailey" tyres. The treads have circular studs projecting from their surfaces which, we are told, prevent side-slipping. The vaporiser, which has been used on the burner of the Chelmsford Car for a distance of 3,000 miles, had been removed and cut up into a large number of pieces in order to show the life of this important portion of the Clarkson system. It showed but little depreciation, and a remarkable absence of carbonisation. Sectional samples of the special pipe unions, employed for connecting the solid drawn steel steam pipes, were on view; these unions provide a support for the pipes a considerable distance on each side of the joint, and the joint is made by squeezing a copper washer between the flanged ends of the two pipes. A boiler shell was also on the stall; it is made out of quarter-inch steel, and the top plate and the cylindrical portion are cold-drawn in one piece. The entire shell is afterwards electro-galvanised. One of the latest burners, together with the automatic regulator, which was described and illustrated in our description of the Chelmsford Car, is seen in another illustration. The chief alterations which have been made are that the vaporising coil now consists of only one and a half turns of the pipe, and that a large number of nickel wires are employed beneath the vaporising coil in order to prevent any blowing out of the burner when the flame is lowered. These wires form two concentric fringes, through which the combustible mixture passes during combustion. Each wire hangs downwards from a pin securing it to the burner, but is not rigidly fixed in position.

The English Gardner-Serpollet Company showed samples of their 6 and 12-h.p. carriages, as also a chassis, the engine of which was shown running with compressed air. A fine assortment of French-built Gardner-Serpollet vehicles were to be seen on the stall of the Speedwell Motor and Engineering Company, their exhibit including the new 40-h.p. chassis, which we have referred to on previous occasions, and some of their 6, 10, and 20-h.p. vehicles. The 10-h.p. model is similar to the 6-h.p. in outward appearance, although it has a larger boiler and engine; the bore of the cylinders has been a good deal increased, but the stroke is slightly shorter. Many small improvements have been made in all the cars, and a relief valve is now fitted to the pipe which delivers fuel to the burner.

A new steam car, of which the general appearance is seen in our illustration, was shown by the Albany Manufacturing Company. It is known as the Lamplough-Albany car, and is built by the Company at their Willesden works. We do not propose to enter into full details concerning the system at the moment, although we intend to do so shortly. The system differs considerably from any others with which we are acquainted, and aims at automatic action throughout. The general construction of the machine is as follows:— The main frame is built up of channel steel, and the axles, which are connected together by tubular reaches, are tubular. The suspension is obtained by full elliptic side springs at the back, and by a transverse spring in front. The boiler is of a semi-flash type, and is fitted beneath a bonnet in front. The engine has four single-acting horizontal cylinders arranged in pairs opposite one another. It is fixed behind the boiler, with its crank-shaft lying longitudinally. A central gear-wheel transmits the power from it to a second shaft beneath it, and this is connected by a universally-jointed propeller shaft with bevel-gearing about the differential on the live-rear-axle. The fuel employed is either petrol or kerosene, and the burner is of special construction. The engine can develop about 24-h.p., with a boiler pressure of about 300 to 400 lbs. per square inch. The speed of the car is regulated entirely by varying the cut-off of the steam to the cylinder, the valve-gear for which is of unusual design. The car shown was fitted with tiller-steering, although wheel-steering can be substituted if preferred. The fuel and water feeds are automatic, though auxiliary hand-pumps for both are also fitted. The exhaust steam is condensed, and the water used over again. Foot and hand-brakes are provided and the car is intended to accommodate four passengers.

English built steam vehicles were also shown by the Motor Construction Company, whose "Vapomobile" steam cars have already been referred to in our columns. The vehicles shown were of three different sizes, fitted with 5, 8, and 12-h.p. engines. The last-mentioned, which is seen in our illustrations, has roller bearings throughout the engine, and the two former ball bearings. The engines are all of the twin-cylinder, double-acting, high-pressure type, and are of neat construction. Several important improvements have been adopted since these cars were last shown to the public, and other improvements are being still further developed. The Company have not as yet settled upon a standard model, although they have built a considerable number of vehicles, and have met with no little success with them. They showed many parts of steam cars, both of their own construction and of American manufacture, amongst the latter being samples of the Mason engine, and an ingenious apparatus for automatically regulating the water level in boilers.

(To be continued.)

Motor Bicycle Track Record.—At the Alexandra Palace on February 14th Maurice Fournier, with a flying start, covered the mile in 1 min. $36\frac{1}{3}$ secs., thereby beating his own previous best record by 2 secs.

After a considerable amount of correspondence and announcements in the Press, a Motor Cycle Race for £1,000 stakes (£500 a side) has now been finally arranged between Maurice Fournier and C. Barden to take place on the Canning Town track on March 7th next. The race will start at 4 p.m., and be ridden in five heats of 1 mile each, as follows:—

Two heats of one mile each with flying starts; two heats of one mile with standing starts; and the remaining one to be either with standing or flying start, as may be decided.

The stakes and the whole of the gate money will go to the winner of three or more of the five heats.

In addition, Fournier with a machine fitted with an "Automotor" engine will make an attempt upon the one hour's world's record.

"The Verdict. It was a great show, so great that it is difficult, if not impossible, to conceive how there can ever be a greater one, it matters not from what standpoint it may be viewed."

The above is the modest reflection of the American opinion, as voiced by one of the automobile press, of the result of the Madison Square Gardens Automobile Show recently held in New York. Last week we gave publicity to a few figures of the business announced to have been done during the Exhibition. We fear we have done the traders an injustice, but their own modesty must be blamed in claiming so little. Further reports to hand give the sales to private individuals as 1,250,000 dollars, to agents and dealers, 8,000,000 dollars. Gross total of $9\frac{1}{4}$ millions. The American public are evidently taking to automobilism in no half-hearted way.

MOTOR CARS AS FEEDERS TO RAILWAYS.

By the Hon. John Scott Montagu, M.P.

Mr. Scott Montagu, M.P., in opening his interesting paper, said that the development of the motor car movement in this country was at too early a stage yet to say whether its influence would eventually be beneficial or detrimental to British railways. But he thought, speaking broadly, that the motor car would undoubtedly convey much of the short distance traffic both for passengers and goods, particularly in view of the general improvement in our roads which was taking place. The railway companies, by an intelligent use of the automobile, could not only assist their own traffic but avoid much wasteful competition, such as building branch or duplicate lines, which *per se* did not pay, to only act as feeders for the main line.

Mr. Montagu divided his paper into motor cars as feeders, firstly, of passenger traffic, and secondly, of goods traffic. Speaking of the first he said there were two sorts, the regular and the occasional passenger. With the former every minute was precious, and he had to reckon his journey by the time taken from door to door. In other words, it was a case of living so many *minutes* from town instead of *miles*, and his object was to reduce the number of these minutes in getting to his business. The efforts made by the railway companies in this direction entailed serious inconvenience to their ordinary working, and entailed enormous and unnecessary expense. He thought that the railway companies within a radius of a few miles of such places as Brighton, Basingstoke, Didcut, Epsom, St. Albans, &c., should arrange to collect their passengers by motor car as they now collect goods by vans and horses. He maintained that a great amount of time, energy, and money was spent by competing companies in every principal town in canvassing for goods and parcels, thereby absorbing a large proportion of what would otherwise be profit. Why should not the same trouble be taken to secure parcels of humanity? asked Mr. Montagu. A well-filled passenger train paid the railway companies equally well, some experts thought rather better, than a goods train, and while the companies would send a van to fetch a passenger's hatbox, and be responsible for its arrival at a particular destination, charging an inclusive rate, they would not collect him or take any steps to assist him in getting to his terminal station or deliver him when he arrived at his destination. The company who first took this matter in hand would undoubtedly secure the excursionists' patronage. Passengers living geographically near London were often as far off in point of time as passengers living at two or three times the distance, owing to it not being worth while for the railway companies to build branch lines for small groups of population. Motor car services should in such instances be instituted for early morning and evening passenger service, and if built on suitable lines, used for the conveyance of light parcel traffic during the rest of the day.

Among occasional travellers were included long distance travellers for pleasure or business for whom motor cars might be run in connection with express trains stopping at principal stations. At present principal stations, such as Bournemouth, Bath, Rugby, Leicester and Norwich were merely centres to which branch lines converged from which passengers had to change from the fast trains on to local lines. As instances where such motor car services might well be instituted, Mr. Montagu mentioned Stamford from Peterborough; Dunmow on the one side and Hertford villages on the other from Bishops Stortford; Semway or Gillingham and Wantage from Shaftesbury. In cases of comparatively large towns such as Stamford, a service three or four times a day each way might be necessary. In more rural districts three days a week in one direction and three days in the other would give sufficient travelling facilities in most cases. Although he was aware that the legal limit was 12 miles an hour, in daily practice *he had been told* that this was exceeded. If the railway companies did not encourage and foster every possible means of inducing travellers to journey by their systems, plenty of other people, notably the electric tramway companies, would undoubtedly take up the matter and thereby damage the suburban receipts of the trunk lines. Many places of considerable importance in Scotland, where engineering difficulties prohibited the construction of railways, motor cars could be economically employed, as the service could be suspended, or partially suspended, during the winter months where there was only summer and autumn traffic, or else their activity shifted to another sphere. In country districts, from the poor man's point of view, and the wife's also—an important factor—it was not the train journey but the getting to and from the station at a reasonable cost and in reasonable time, that was the trouble. By the adoption of motor cars at suitable stations for dealing with the local passenger traffic additional opportunities for through bookings would probably increase the receipts of the railways as the tourist could be booked straight through, for instance via Salisbury on a visit to Stonehenge, or via Richmond to Richmond Park, Windsor for Windsor Forest, &c. Arrangements could be made for making circular tours and therefore increase the interest of the journey by the cars taking the passenger to some totally different station on his return. The same railway department which now supervised horses, vans, and parcels could take the matter in hand. He thought that with reference to certain branch lines which undoubtedly did not pay, a motor car service should be substituted and even in some cases they should be boldly made into motor roads by bringing the material on the road bed up to the level of the rails without, of course, necessarily removing them. A motor car running on such roads would have no speed limits and could prolong its journey beyond the present terminal station. He maintained that the question of not being able to get a reliable motor free from breakdowns, was a thing of the past. There were several firms now in the market capable of building and supplying really reliable cars, and it would be found that if an order for 100 motor cars were given a very great reduction in cost would be effected. In the milk traffic the automobile could help materially. A general system could be devised which would stimulate existing traffic by tapping individual farms on the road and picking up agricultural products *en route*. On the return journey the cans could be dropped at the same points and other goods distributed at the same time, and the farmer would be only too glad to be relieved of the trouble and expense of keeping a man and a horse and probably a cart for this special purpose. The running of automotor railway carriages similar to the ordinary tram car was also another use to which the automobile system could be applied. In regard to goods traffic, under the present system the cost of distribution and collection was enormous in London, and the goods van mileage compared with the weight of goods carried was ridiculous. Van horses could not work every day of the week, and he understood that the distance they covered rarely exceeded 15 miles per day, and whilst the horses were resting portions of the staff must be resting, too. Motor vans could cover much greater distances at less expense, and be working continuously. He pointed out the possibility before long of motor lurries taking freight and merchandise to big goods stations outside the metropolitan area, like Willesden for the North-Western, Acton or Ealing for the Great Western, and Earlsfield or Wimbledon for the South-Western, and thereby rendering available the enormously valuable sites at Euston, Nine Elms, &c., for other purposes. In regard to drivers, the old locomotive driver, perhaps slightly past his prime, would be fully reliable and fit for many years' work although past the strain of express train traffic. Old guards in like manner would make excellent conductors, and the pension list of the companies would thereby be reduced. The companies' locomotive shops would no doubt in time turn their attention to motor car building, and the larger railway companies in a few years would possibly find it pay to start their own motor lurry building. In regard to the cost of running—a first consideration—for passenger traffic the consumption of petrol would not exceed 1*d.* per mile. The wear and tear of solid rubber tyres 2*d.*, driver 35*s.*, conductor 25*s.* per week (giving 4*d.* per mile for 30 miles a day, for six days a week), and 2*d.* should be written off for wear and tear and depreciation. These figures, giving a total of 9*d.* per mile, erred on the 'extravagant side. Assuming such vehicles, capable of carrying 20 passengers, carried an average of 12 passengers each journey, a minimum of 1*d.* per mile could be charged, showing a profit of 3*d.* per mile. As to goods, as he had already said, the horse hardly averaged more than 10 to 15 miles a day. The motor lurry's powers were limited only by its speed. Mr. Montagu then gave some figures supplied to him by Messrs. Bass and Co., the eminent brewers. At first the motor car proved slightly more expensive than horses, but when the men and the service were properly organised there was a slight saving over animal traction, and eventually they had no doubt that even better results would be shown. The figures given were:—Tons carried 300 days, 2,326; cleaning, 36 days; repairs, 20½ days; wages, £224 16*s.*; fuel, £72; repairs, £32 6*s.* 5*d.*; insurance, £15 16*s.*; total, £344 19*s.* 5*d.*; depreciation, £100; interest, £25; total cost, £469 19*s.* 5*d.* Dealing with the question of the absurdity of metropolitan locomotion, Mr. Montagu pointed out the anomaly that a man could get from Euston to Rugby in about an hour and a half, and as long, or longer, was taken to reach Croydon or Brixton from the same point. In his opinion, the future of town locomotion must be high level streets specially reserved for fast traffic, or existing streets widened even at great expense. So far, the omnibus companies had signally failed to appreciate the value of mechanical traction, and railway companies should establish inter-communication by means of motor buses between their termini. The companies should be warned by the competition of electric tramways, which had already been the cause of stations being absolutely closed on the North Eastern Railway

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[*] An Excerpt from a paper read at the Automobile Club, February 13th.

near Newcastle, and the North British Railway near Glasgow, and what had happened with tramways might happen again in the future in connection with other tramways or motor buses. If the companies were wise in time they would at any rate give attention to collecting their passenger traffic. The North-Eastern had already, through the force of this competition, ordered automotor cars. The South-Western were also on the eve of running some steam automotor carriages on the branch line between Fratton and Southsea, whilst in France, Serpollet steam cars were being constructed for the Paris-Lyons-Mediterranean Railway. In conclusion, Mr. Montagu said, *festina lente* may have been good enough in past years, but we live now in an age of hurry, and railway authorities must realise the demands of the age, aud meet the wants and wishes of the population through which it runs. To do this, every new mode of traction must be linked up and utilised in conjunction with existing methods. If, on the other hand, the gospel of the "have a beens" prevails, he saw a future by no means rosy for British railways. Progression or decay was as much a law of commerce as of Nature.

The Chairman (Mr. Worby Beaumont) invited discussion, and amongst those who took part were Mr. Monckton, of the Great Central Railway Company, Col. Crompton, Mr. R. W. Buttemer, Mr. H. G. Burford, Mr. J. S. Critchley, and Mr. E. R. Calthrop. Mr. H. G. Burford said that any speed over twelve miles an hour for public vehicles was impracticable on account of the cost of the upkeep, and that a department controlling horse vans would be unsuitable to deal with motor vehicles. Mr. J. S. Critchley considered ten miles an hour the maximum for running heavy machines. Mr. E. R. Calthrop, as a locomotive man, said that if locomotives were treated as motor cars they would have just as many breakdowns. What was wanted was systematic inspection. Mr. E. Shrapnell Smith was against employing motor lurries for town work, and did not consider old engine drivers' knowledge would be quite suitable.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

Re TYRE TRIALS ORGANISED BY THE AUTOMOBILE CLUB.

To the Editor of The Automotor Journal.

Sir,—After having complied with all the conditions made for the above trials, and also having finished far ahead of any other competing tyre, we were considerably surprised that the first prize was not given to the Collier tyre.

We now beg to enclose you copies of two letters we have written to the Automobile Club, and also their reply to the first one. We are still awaiting their reply to our last letter.

We shall be glad if you will kindly insert this correspondence in the next issue of your valuable paper, as we think it will be interesting to your readers to know how the matter stands.

Yours faithfully,
The Collier Twin Tyre Company, Limited.
W. George Williams, General Manager.

February 17th.

(*Copy of correspondence enclosed.*)

210, Shaftesbury Avenue,
February 2nd, 1903.

Gentlemen,—We have carefully read the report of the Judges in the *Club Journal* of January 29th, and we at once write to enter a protest against the decision under which the first prize for such trials has been awarded to the tyres fitted to car T 2 belonging to the Dunlop Pneumatic Tyre Company.

May we draw your attention to the fact that the conditions under which we entered for these Trials are correctly stated under rules, page 3 of supplement, and that the judging was to be on the following points:—

(*a*) One mark to be deducted for every minute spent in tyre inflation or repairs, whether in the control or on the road.
(*b*) Price of tyres.
(*c*) Loss of weight.
(*d*) Condition as shown by periodical examination and by photographs taken during the trial, and by examination at the end of the trial.

The limits and conditions were thus clearly defined. It was to be a test of durability and reliability, taking into consideration the price, loss of weight, and condition of the tyres.

The Judges' report is as follows:—

Clause A. (Reliability).—T 2 lost 87 marks; T 7 lost 48 marks.

Clause B. (Price per inch).—T 2, 34 inches, 2*s.* 0·45*d.*; T 7, 34 inches, 2*s.* 4*d.* Loss of weight.—No variation established.

Clause D. (Condition of the tyres).—Good in all cases.

It was not until your letter of October 4th, when the 4,000 miles was nearly completed, and we were far ahead of our competitors, under Clause A, that we heard anything about further tests, which tests (as shown in the Journal of October 9th last) were suggested by Mr. Edge, for many years closely connected with the Dunlop Tyre Company.

The only one of the additional tests that we were present at was that for facility of detachment. Under this test the Dunlop tyre on Car T 2 took the same number of minutes as our own tyre on Car T 7, though no one reading the report would understand this.

With reference to the resiliency trial, we know absolutely nothing about it except that it has been made. We had no notice when our tyres were being tested, and when we were asked by the assistant secretary on the telephone if we would allow a stranger to put our tyres for this test on the wheels, we refused, but stated we would willingly send a man down at our own expense to do this rather than have strangers meddle with our tyres. We do not even now know by whom the new tyre was adjusted, and we fail to see what reason there could have been for not giving us notice and allowing us to be present.

In these circumstances we venture to suggest that, on the conditions under which we entered into the competition as specially set forth in the rules, we should be awarded the first prize, our contention being that no modification of these conditions could be made without the consent of all parties, and that when the matter was submitted to us we declined to agree to same except as a separate issue. (*See* our letter of October 7th, copy of which we enclose.)

In making the above request, we trust you will understand that we are satisfied that the Judges have carried out their duties in a perfectly fair and impartial manner; at the same time, we maintain that the award does not follow the judgment on the points we competed for. May we at the same time respectfully request that any members of the Committee who may be in any way, directly or indirectly, connected with the Dunlop Company, Mr. Du Cros, or their allied companies, should abstain from voting in a matter in which they may be, although perhaps unconsciously, prejudiced.

As this matter is a very serious one with us, may we ask for a reply by return.

Yours truly,
(Signed) J. J. Purdie,
Chairman of Directors.

To the Committee of the Automobile Club.

The Automobile Club, 119, Piccadilly,
February 3rd, 1903.

Dear Sir,—The letter of your Chairman, dated February 2nd, and its enclosures, have been placed before the Executive Committee, who direct me to inform you that, although in the original prospectus of the trials it was stated that certain points would be factors in connection with trials, it was at no time stated that these were to be the only factors, nor was any limit placed on the scope of the trials in order to arrive at a decision as to which is the best tyre. The Committee left the Judges to decide what, in their opinion, were other tests necessary to enable them to arrive at a decision for publication as to which are the best tyres, and the Committee consider that the Judges have in no way exceeded the powers given to them.

The Committee, therefore, do not see their way to interfere in any way whatever with the action taken by the Judges or with their report thereon.—Yours faithfully,

(Signed) C. Johnson, Secretary.

The Secretary,
Collier Twin Tyre Company.

210, Shaftesbury Avenue,
February 6th, 1903.

Gentlemen,—With reference to your letter of February 3rd, we are sorry that we cannot agree with the way you put the terms under which we entered for the Trial. It was definitely understood that the points which were specified were to be the only factors in connection with the Trials, and in our previous letter we have pointed out how the further factors arose.

As this matter is of great importance to us, and we feel we are suffering under an injustice, we hope you will have no objection to our publishing the correspondence in order that the public may realise the exact situation, and judge accordingly.—Awaiting your reply, yours faithfully,

The Collier Twin Tyre Company, Limited.
(Signed) W. Geo. Williams,
General Manager.

To the Committee, Automobile Club.

Mr. E. Shrapnell Smith, under medical orders, sailed for Grand Canary last Saturday for a month's holiday.

A steam motor fire engine with a pumping capacity of 400 gallons a minute is to be acquired by the Brighton Corporation.

French automobile manufacturers have already secured 175,000 square feet, or ten times the area of the Madison Square Gardens, floor space at the St. Louis World's Fair, 1904. "Wake up, England!"

During January 540 cars were imported into Great Britain, as against 173 for January, 1902. The value of these imports was £167,112, the British exports only amounting to £16,876.

As a prize for the Children's League of Pity Bazaar, the Marchioness of Tweeddale has presented an Oldsmobile petrol car, the proceeds of which will go towards swelling the bazaar fund. This car was on view at the recent Edinburgh Automobile Show.

At the Manchester Cycle and Motor Show, which opened on Friday last, a good assemblage of motor vehicles of most of the leading makes, both foreign and British, was on view, several of the identical cars which were recently seen at the Crystal Palace being staged by local representatives.

Taking advantage of the experience of his royal father, H.R.H. the Prince of Wales is having a set of Goodyear tyres fitted to his new Daimler car. The front wheels will have pneumatic tyres and the back wheels endless solid, a combination which has been found to answer extremely well for heavy cars.

To more effectually neutralise the vagaries of his balloons when descending at awkward spots, Mr. Leslie Bucknall has added to his balloon equipment a Werner motor bicycle, which he proposes to take up with him in his journeys through the air, and be thus rendered less dependent on outside help in the event of his landing some miles from any town or railway.

The successful running of the Stirling motor omnibuses, of which a large number are shortly being launched for regular public service in London, has already borne fruit far afield, as the company building these vehicles—Stirling's Motor Carriages, Limited, Edinburgh—have just received an order from Johannesburg for a vehicle to be fitted with a 24-h.p. Stirling motor, accommodating 16 passengers.

Since opening our subscription list for improving the Gordon-Bennett course in Ireland, it has been pointed out to us that no real object is served by the existence of a number of independent subscription lists. We have accordingly advised all those who have written to us offering subscriptions to forward them direct to the Automobile Club, and we shall be glad if in future those of our readers who desire to help the cause in this way will also send their subscriptions to the Club direct.

Taking legal action against powerful Corporations by private individuals requires considerable pluck, and in most cases running the risk of being mulcted in heavy costs. It is with the greatest pleasure, therefore, that we are able to record that the action taken by Mr. J. F. Monier-Williams, a well-known London stockbrocker, and another against the Provincial Tramways Company, Limited, for damages to his motor car owing to the bad state of the repair of the Company's tramways in Gosport, resulted in a verdict in favour of Mr. Monier-Williams. Mr. Williams and his wife were on a motor tour in the Southern counties, and the Gosport road in question was in such a bad condition, owing to the neglect of the Tramway Company, that he had to slow down to about four miles an hour, and, when passing over the tramway owing to traffic requirements, his hind wheel skidded and got stuck in the tramway rut due to the fact that the line had sunk, and the pitching was worn. He lost control over his machine and, unfortunately, landed with his vehicle into a shop window. In spite of all the arguments of the Tramway Company's counsel, the jury at once found that there was negligence on the part of the Tramway Company, and that there was no contributory negligence on the part of plaintiff himself, damages of £40 being awarded to Mr. Monier-Williams.

The question of the application of mechanical propulsion for the time-honoured London omnibus has been once more brought forcibly before the public by the general meetings both of the London General Omnibus Company and the London Road Car Company. The attitude of the General Omnibus Company is much more conservative, to say the least, than that of the Road Car Company. The Chairman seems to think they are getting on very well as it is and is not at all inclined to go in for an extended or indeed any application of motors for omnibus propulsion. His position is that the Company should practically wait until somebody else has proved the applicability of the motor to the omnibus before taking it up. In the meantime the position was satisfactory and the omnibuses were well patronised. Why therefore go in for these novelties? The principal speakers at the meeting were more anti-motor than even the Chairman. Mr. Lee Smith, in approving the Directors' policy, thought that motor omnibuses were dangerous things to begin with, and that the motor omnibuses already running were not a bit of good. The Deputy Chairman spread himself on the question of mechanical traction generally. He was emphatic but not altogether well-informed. Electricity he put out of court altogether, and steam he regarded as impracticable on account of vibration! This statement is amusing, though we do not see from the reports that the shareholders were sufficiently up to date to be amused by it. One very important consideration escaped the speakers at the General Omnibus Company's meeting. No doubt the Company is doing good business at present. We have their word for it. The question is, what kind of business will they do when they have to compete with a rival company running fast motor omnibuses?

Very different was the attitude of the London Road Car Company. They are prepared to experiment exhaustively in the application of mechanical propulsion to ordinary 'bus traffic. They do not appear to be frightened by the remarks of the expert who terrified the deputy chairman of the General Omnibus Company with the statement that for every two motor 'buses running, a third would have to be kept in reserve on account of breakdowns. The Chairman of the Road Car Company is very rightly of opinion that the trump card in omnibus competition will be held by the Company that secures a monopoly of the best motor 'bus. With a view to ascertaining which 'bus to adopt, they are making their experiments with several types of vehicles.

LAST Saturday afternoon the Yorkshire Automobile Club held their second run of the season, the goal being Knaresborough, about 20 miles from Leeds and 24 from Bradford. Fine but boisterous weather was experienced, and the roads were in excellent condition. Fourteen cars arrived at Knaresborough before 4 p.m., some having travelled *viâ* Harrogate and some *viâ* Follyfoot, the steep Brigate hill into Knaresborough, reported to have a gradient in some places of 1 in 6, having to be ascended by the latter route. Those taking part in the run included:—Mr., Mrs., and Miss Harrison Benn, 22-h.p. Daimler; Mr. H. R. Kirk, 12-h.p. Gladiator; Messrs. Dougil, 10-h.p. Loidis; Mr. Faiers, Mr. Broadbent, and Mr. Jones, 9½-h.p. Clément; Mr. and Mrs. Atkinson, Mr. Woolf and party, Mr. and Miss Armitage; Mr. and Mrs. Bruce, 8-h.p. Darracq; Mr. B. Walker, 8-h.p. De Dion; Mr. and Mrs. Rowland Winn, 4½-h.p. Renault; Mr. Wharam and Mr. Nicholls, Mr. Mortimer; Mr. W. F. Greenwood, 4½-h.p. De Dion; Mr. H. A. Jones and Mr. Dix, 4½-h.p. Pieper. The return journey was commenced at 6 p.m., and a fine though windy run home terminated an extremely pleasant outing.

UPON the occasion of the Annual Dinner of the Scottish Automobile Club (Eastern Section), held on the 13th inst. in Edinburgh, Dr. Dawson Turner, Vice-President, presided over a company numbering about 80. The guest of the evening was Mr. S. F. Edge, and amongst those present were Mr. Charles Jarrott, Mr. J. Adams, of Glasgow, Mr. Norman D. Macdonald, Dr. Blair, Dr. Renoldson, Messrs. Macaulay Smith, R. J. Smith, J. W. Irons, W. L. Sleigh, Patterson, W. H. Kingsbury, G. MacMillan, and J. W. Stocks. Mr. N. D. Macdonald, in proposing the toast of "The Guests," said that automobilists in this country have had to fight the way for themselves, and he claimed that they had greatly benefited the country not only as regards giving pleasure to many and allowing others to travel more quickly for business purposes, but had caused a great amount of money to move about in the interests of trade. Mr. Macdonald drew some strong contrasts between the want of assistance in furthering automobilism in this country by the Government and the Municipalities, and the strong support given by the authorities in France. He was glad, however, to say matters were improving in this respect in this country, and people now realised what automobilism was; and, thanks to the efforts of a man like Mr. Edge, it had been demonstrated that as good cars could be obtained in this country as in any other.

Mr. S. F. Edge, in acknowledging the toast, predicted a brilliant future for automobilism, and the ultimate triumph of machinery over animals. Automobilists, he said, were the pioneers of one of the greatest industries and movements that the world had ever seen. Clubs would have a great influence in pushing the movement forward, but their watchword must be combination, as if split into units they would move very slowly. He advocated the encouraging of new ideas by manufacturers of motors, the smallest application of fresh ideas being worthy of careful consideration so as to enable the makers to strike out in new directions. The racing was only the showy side of the whole movement, and they had to think of the brains which developed those vehicles, and the winning of the Gordon-Bennett Race, which was largely due to Mr. Napier, a characteristic Scotchman in every sense of the word.

ON Monday evening last the Western Section of the Scottish Automobile Club held their annual dinner in the Windsor Hotel, Glasgow. The Hon. the Lord Provost (Mr. John U. Primrose) presided, and amongst those supporting him were the Right Hon. Sir John H. A. Macdonald, K.C.B., Lord Justice Clerk of Scotland, Mr. Roger W. Wallace, K.C., Bailie Stevenson, Sheriff Fyfe, Lieut.-Col. M'Farlane, Chief Constable Stevenson, Professor Hugh Galt, Dr. James Kirkland, Colonel Smith Park, Messrs. James Ochs, Norman D. Macdonald, Claude Johnson, John Macdonald, George Macmillan, Henry M. Napier, James R. Nisbet, Nicol P. Brown, Henry Brock, William Weir, W. Naismith, John Motherwell, John M. Ross, J. W. Macintyre, and R. J. Smith (Hon. Secretary).

The Lord Provost, in proposing the toast of automobilism, said that anything more exhilarating than swift projection through the air in an automobile he thought it was impossible for humanity to conceive. After pointing out the enormous loss to this country through the indifference and appallingly conservative feeling with which all new ideas were treated by the Briton, the automobile movement had back in the thirties been throttled in its inception. At a time when many national sources of wealth and employment were becoming more limited in their character they must look to other industries to afford employment for the teeming population. Automobilism was a factor to be acknowledged in the physical well-being of the nation. It was possible to imagine in the near future that the motor car would perform the functions of the horse-drawn wagon at a cost which would put horseflesh utterly out of competition with it. The Lord Justice Clerk, in replying, said it was beginning to be realised that the new method of locomotion was not one which was confined to amusement, but was to confer the greatest possible benefits on the community in their social life and in their commercial prosperity.

The list of exhibitors at Mr. C. Cordingley's Automobile Exhibition at the Agricultural Hall, opening the middle of March, has been issued, and from this there is every prospect of a first-class exhibition in spite of the magnificent display of automobiles recently closed at the Crystal Palace. That the industry can at the present time support two Exhibitions of the character and importance of these two, to say nothing of the Stanley Show at Earl's Court which immediately preceded the Palace Exhibition, is very convincing evidence of the healthy state in which the automobile industry must be. Mr. Cordingley has made several commendable arrangements for the comfort of his visitors, including a lounge capable of accommodating 200 people. A band will be provided in this annexe, and promenade concerts given at regular intervals. So as to be well up to time, Mr. Cordingley announces his 1904 Exhibition to be held from March 19th to 26th. The "Passe-Partout" carriage which was stranded in Russia will again be on view at the Exhibition, this time, however, on Friswell Limited's stand, it having been just secured by Mr. C. Friswell, who travelled to Clerio, near Nijni Novgorod, for the purpose of arranging for the return of this vehicle.

There are now 54 Automobile Clubs in the United States.

The next New York Automobile Show will probably be held in January.

A competition for anti-skid devices is to be arranged by the A.C. de France.

The King of the Belgians has—following a careful inspection at both the Paris and the Brussels Automobile Exhibitions—added a Charron-Girardot-Voigt car to his stud of motor vehicles.

Washington's birthday is to be celebrated by the A.C. of America by a run from New York to Lakewood to-day (Saturday), a paced return run to New York being arranged for to-morrow (Sunday).

The 1903 Racing Committee of the American Automobile Association is as follows:—Messrs. W. S. Stewart (chairman), Windsor T. White, H. S. Harkness, S. A. Miles, and A. R. Pardington.

The Mi-Careme festivities are to be this year largely automobile in character, a special commission having been appointed by the A.C. de France, at the request of the organisers of the carnival, to take in hand the details to ensure a magnificent spectacle being "staged."

Edison's battery was the centre of much curiosity at the Madison Square Show. Details from the attendants were not easy to obtain. Delivery, however, within a fortnight of a complete set of batteries for the purpose of driving a delivery wagon of B. Altman and Co., the New York dry goods merchants, was a definite promise given by one of the representatives of the Edison Company.

The American Motor League appears hitherto to have met about twice a year, apparently, only to elect officers. Isaac B. Potter, a lawyer of New York, has been appointed President for the current year. Possibly, under his guidance, the League may become an active body, as Mr. Potter brings with him a very great reputation as a worker for the League of American Wheelmen. As a good-road advocate he has also made a strong mark.

The "automobile launch" devised by Count Zeppelin, of navigable airship fame, is a craft which has its propellers in the air and will, therefore, according to the inventor, be of great use in tropical lakes and rivers encumbered with aquatic plants which, obstructing the screw, render an ordinary steam launch useless. The Count's vessel has a draught of only 10 inches, and is stated to "skim the water at a rate varying from 14 to 16 miles an hour."

With Alderman Palmer in the chair at the Chicago Council, an ordinance enforcing 8-inch identifying figures on automobiles was passed unchallenged. Subsequently, as President Palmer of the Chicago Automobile Club, he presided over a meeting of the Club members at which a resolution of defiance and indignation at the ordinance was unanimously passed. Later Alderman Palmer introduced a further town ordinance reducing the size of the identifying numbers to 4 inches. Mr. Palmer is now plain Alderman Palmer, as his "resignation" of the Presidentship of the Chicago Club has been accepted.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

City and Suburban Electric Carriage Company (1903), (Limited).—Capital, £152,000, in £1 shares (2,000 deferred). Objects: To acquire the business carried on by P. E. Singer, of 19, Kensington Court, London, at Niagara, York Street, Westminster, and elsewhere, as the City and Suburban Electric Carriage Company.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1901.

Published February 19th, 1903.

21,452. R. E. Evenden. Gear wheels.

Published February 26th, 1903.

21,956. Vogt. Internal combustion motors.

Applied for in 1902.

Published January 29th, 1903.

909. F. R. Simms. Internal combustion engines.
910. F. R. Simms. Motor vehicles.
2,471. R. Harrison. Elastic wheels.
2,491. W. N. Dumaresq. Method of driving motor cars.
2,567. M. E. P. Charboche. Lubricating devices.
2,833. J. C. Merryweather. Automobile fire brigade vehicles and fire escapes.
3,510. T. A. Dicks. Change-speed and reversing gears.
3,653. Cie Francaise des Voitures Electromobiles. Motor road vehicles.
3,888. C. H. Reynolds. Transmission gear of motor bicycles.
3,920. D. Albone. Motor tractor for agricultural purposes.
5,120. A. G. Melhuish. Gas and oil engines.
5,174. H. Lucas. Acetylene lamps for motor cars.
5,615. E. Hospitalier. Mechanical accumulator or auxiliary driving apparatus.
7,896. C. Schafferkötter. Starting of explosion engines.
8,930. W. R. Pidgeon and E. F. Bradley. Automatic mixing device.

Published February 5th, 1903.

945. A. J. I. Rath. Pneumatic tyres.
1,415. J. J. Bourcart. Motors using explosive gases.
3,189. H. Spurrier, Jun. Steering gear.
3,525. A. L. Bricknell. Method of stopping sideslip.
12,857. W. E. Winship. Storage batteries.
20,204. A. H. Wall. Friction clutches.
22,270. Soc. Anon. Automobiles Belgica. Regulators for lubrication.
23,285. C. Stollewerk. Two-speed driving mechanism.
25,722. J. W. Lovegrove. Protective outer garment.

Published February 12th, 1903.

2,490. A. Tincon. Variable speed gear.
3,819. J. T. Noblett. Storage batteries.
5,587. W. G. Wilson and others. Commutators.
5,599. J. Grouvelle and H. Arquembourg. Coolers or condensers.
23,111. C. J. Pollock. Motors.
23,518. H. Tenting. Gas, petroleum, or alcohol two-cycle motor.

Published February 19th, 1903.

1,981. F. W. Schroeder. Road wheels.
2,370. H. A. House. Steam boilers.
2,417. B. Musgrave. Gas and oil engines.
3,625. C. Osborn and others. Igniting devices.
4,472. W. and K. A. Rowbotham. Gas, oil, hot air, and like engines.
5,803. B. H. Chameroy. Protecting pneumatic tyres.
6,994. W. Norris and others. Brakes.
17,924. H. Luthy. Electric igniting candle for explosion motors.
24,592. G. A. Lemaitre. Internal combustion engine.
24,737. T. Midgley. Metallic vehicle wheels.
27,792. A. A. Low. Igniters for hydrocarbon engines.

Published February 26th, 1903.

2,736. G. Honold. Magneto-electric ignition.
2,882. P. A. Dupont. Rotary motor.
4,296. W. Radford and E. Gifford. Driving gear.
5,121. A. G. Melhuish. Portable oil engines.
5,143. A. Oates. Locomobile and other rotary fluid motors and pumps.
6,304. Accumulator Industries (Limited). Accumulator plates.
6,882. V. R. Nicholson. Means for supplying oil or spirit to internal combustion engines.
6,883. V. R. Nicholson. Internal combustion engines.
7,025. F. W. Dalton and F. R. Wade. Exhaust valve mechanism.
7,115. H. D. Loria. Friction clutches.
7,480. J. W. Hornsby and others. Internal combustion engines.
11,982. J. Seiberl. Flying machines.
21,091. F. Laforge and others. Motor cycles.
22,835. G. Westinghouse. Internal combustion engines.
26,581. Soc. Mutel and Cie Regulating devices.
28,530. F. Charron. Explosion motors.

THE AUTOMOTOR JOURNAL

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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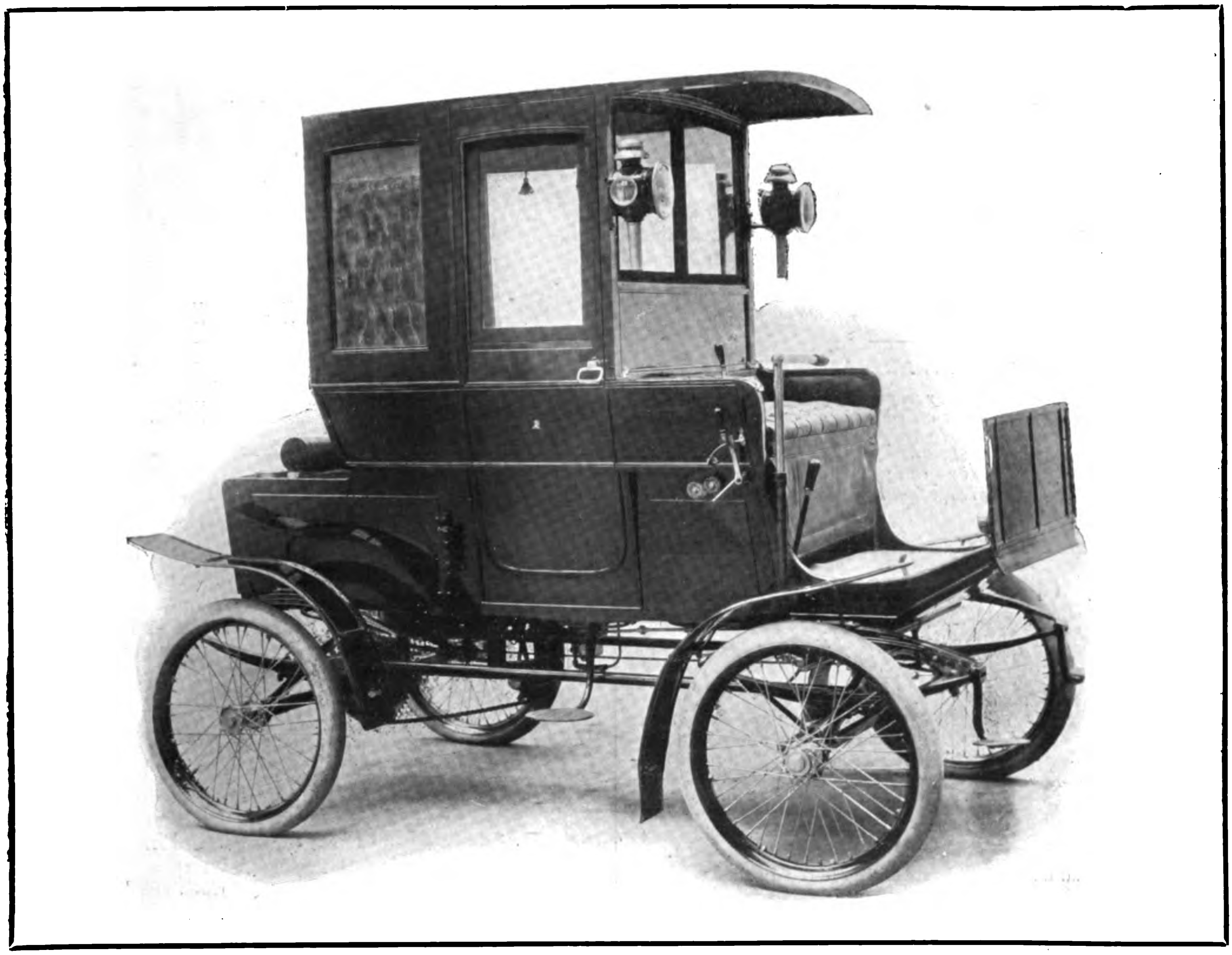

THE LOCOMOBILE BROUGHAM. (*See* page 217.)

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Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

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DIARY OF FORTHCOMING EVENTS.

The Automobile Club of Great Britain and Ireland.

1903.	
March 6 ...	... Discussion on Legislative Proposals.
March 13...	... "The Motor Problem a Road Problem." Paper by Mr. W. Rees Jeffreys.
June 13 ...	... Gymkhana at Ranelagh.
August ...	... Tourist Motor Bicycle Reliability Trial.
September	... The 1,000 Miles Trial.
1904	... Light Van Trials.

General and Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
March 1 ...	... Competition of Silencers (A.C. de F.)
March ...	... "Criterium du Quart de Litre" (*L'Auto.*)
March 8–22	... Berlin Automobile Exhibition.
March 16–30	... Vienna Automobile Exhibition.
March 20–28	... "Criterium des Transports Automobiles." 1,107 kiloms. (*La France Automobile*).
March 21–28	... Cordingley and Co.'s Exhibition, Agricultural Hall.
March 28–April 5	Nice Automobile Week.
April 10 ...	... Eliminating Race for Gordon-Bennett Race.
April 16–20	... A. C. de Touraine Tourist and other Trials.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 14 ...	... Paris-Madrid. Start of Tourist Section.
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June	... Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18–23	... Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 25–July 1 ...	Aix-les-Bains Auto Week (Auto Club du Rhone).
July ...	... Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
July 9 ...	.. Gordon-Bennett Cup Race.
July 11 ...	... Speed Trial at Dublin.
July 13 ...	... Start for International Tour through Ireland.
July 15 ...	... Motor Boats Race, Queenstown Harbour (Alfred Harmsworth Challenge Cup).
July 18 ...	... International Hill Climbing Trial at Belfast (Henry Edmunds Trophy).
July 19 ...	... Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August ...	... Circuit des Ardennes.
September	... Udine Exhibition (Italy).
Oct. 15–21	... Leipzig Exhibition.
Nov. 15 ...	... German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.
1904.	
Feb. 12–24	... Crystal Palace Exhibition.

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PASSING EVENTS.

THE GORDON-BENNETT ENABLING BILL.

UP till late on Tuesday night the prospects of Mr. Scott Montagu's Bill for permitting the Gordon-Bennett Race to be held in Ireland were encouraging in the extreme. There was no suggestion of opposition from any quarter, and Mr. Montagu was sanguine that the Bill would reach the committee stage early next week. Mr. O'Connor had put a question to the Chief Secretary for Ireland asking whether, considering the enthusiasm that the project had evoked in Ireland, and the way it was being backed up by the local County Councils, and the preparation that these bodies were making for ensuring the safety of everybody on the day of the race, the Government would introduce a Bill on the subject. Colonel Saunderson interposed, remarking, amid much amusement, that this was a rare occasion on which the Irish people were at one, and supported Mr. O'Connor's suggestion. Mr. Wyndham's reply was to the effect that Mr. Scott Montagu was introducing a bill on the subject, and that considering the universal interest taken in the race by every Irishman without distinction of party, the Government trusted that the Bill would be regarded as non-controversial. He humorously alluded to Colonel Saunderson as on this occasion at any rate speaking for the whole of Ireland. Mr. Wyndham concluded as follows:—"I do not like to contemplate the possibility of those not directly interested in Ireland opposing a Bill brought forward with the unanimous support of the Irish members, and I hope the Bill may pass by consent. No one can be interested in opposing it." This was the pleasant atmosphere prevailing when the measure was introduced for a second reading on Tuesday night, and then to the surprise of everybody Mr. W. J. Galloway lifted his hat—the blocker's signal—and the Bill was blocked. Mr. Galloway raised his hat on a purely technical objection, that the proposed Bill had not been sufficiently circulated amongst members of the House. Mr. Wyndham, though quite informally, tried to smooth over matters, but Mr. Galloway was not to be beguiled out of his position. He objected, and an objector he determined to remain.

◆

WE are glad to be able to say that Mr. Galloway has withdrawn his opposition, the technical formality on which he insisted having been fulfilled. He also may be said to have yielded to a certain extent to pressure. Blocking private Bills is a game two people can play at. Mr. Galloway himself had a motion down dealing with the law relating to trustees. After Mr. Scott Montagu's bill had been blocked by Mr. Galloway, the compliment was returned and the Galloway motion blocked by Mr. Scott Montagu. This was a position which obviously lent itself to compromise, and the compromise was duly effected, with the result that the bill is well on its way again, and will probably escape the attentions of any other would-be wreckers. It was arranged to be read a second time on Thursday night, and also possibly to pass the Committee stage, and third reading on Friday. At the last moment Mr. Galloway may have shrunk from drawing upon himself the amount of odium which persistence in his opposition would have concentrated upon him. He would very justly have incurred the execration of every sportsman, every automobilist, and without question every Irishman in the Kingdom. He would have gone down to posterity with a certain amount of celebrity, no doubt, but with the kind of celebrity that most people would prefer to be without. He would have become to a certain extent famous—or, rather, we would say, notorious—as a man anxious to attract attention by doing his little best to interfere with the pleasure, profit, and amusement of a whole people, and to injure as far as he could a growing national industry at a critical moment in its development. Probably the most reactionary and antiquated detestor of the automobile movement would shrink from this. We do not wonder, therefore, that Mr. Galloway has abandoned his highly unenviable *rôle*. Really, however, the situation seems to us extremely silly. Unreasonable insistence on rights has seldom much to recommend it, and Mr. Galloway went counter, in so insisting, to the recommendation of a Cabinet Minister of the party of which Mr. Galloway himself is a silent ornament. Probably the real explanation of his withdrawal is that Mr. Galloway was surprised by the strength and amount of the indignation which his action excited, and was glad to retire from the position he had taken up.

THE Bill, which we publish in another column, is drawn in such a way as to empower County Councils in Ireland to set apart any road or roads in the districts over which they have control for races of light locomotives (provided they give proper notification beforehand to the public) on three days during the year 1903. It will be observed, therefore, that the three days give all the security needed in case anything should happen to prevent the day first of all fixed upon for the race from being utilised for the purpose, while if all goes well it will enable one or two hill-climbing competitions to be held in Ireland either about the same time as the race itself or subsequently to it. This is all that we have ventured to hope for, and perhaps a little more, and if it becomes law at an early date, it will confer, both on the automobile industry itself and on the Irish people, the various benefits which we have from time to time enumerated. The highest praise is to be bestowed upon the energy and pertinacity which have been displayed in the matter by Mr. Scott Montagu himself, by the Secretary of the Automobile Club, the Parliamentary agents who have so ably drafted the Bill, and all those who have in a multitude of ways supported and promoted the cause.

DEPUTATION TO THE LORD LIEUTENANT.

PLEASING evidence of local enthusiasm and interest in the Gordon-Bennett Race was provided by the action of the Kildare County Council in going up to Dublin and waiting on the Lord-Lieutenant for the purpose of engaging his influence for procuring the passage through Parliament of an Enabling Bill. Lord Dudley, of course, as everybody knows is, in his private capacity, altogether in favour of the race, and his utterances to the deputation were marked no less by sympathy with their object than by sound common-sense and good advice. He suggested that resolutions passed by as many local bodies as possible should be forwarded to Mr. Wyndham before the Bill is introduced. As, however, Mr. Scott Montagu's Bill has already been introduced into the House, there is perhaps not much necessity for this course of action to be adopted. All the local interests have given such evidence already of their favourable and enthusiastic support of the project as to render the formal statement of their views to the Chief Secretary almost superfluous. In fact, there is no gainsaying the vigour of the outburst of popular enthusiasm on the subject.

A ROUNDABOUT JOKE.

FOR making startling and quaint discoveries in classical, Biblical, and other archæology, our contemporaries on the other side of the Atlantic have few equals, and probably no superiors. It was only a few months ago that one of them startled and amused, if it did not convince, its readers, by an attempt to make out that the leviathan of the Book of Job was an early form of motor vehicle. Another Transatlantic contemporary has now discovered a German professor of the Lycee of Munich—whatever that may be—who maintains that self-propelled vehicles existed eighteen hundred years ago. Our contemporary gives as authority the following:—"The chronicler, Julius Capitolanus, who was a contempoarry of the Emperor Commodius, relates that among the objects of interest left by that ancient ruler of proud Rome there were the *vehicula urte fabricae nova perplexis diversisque rotarum oribus ex exquisitis sedilibus*"; that is to say, "vehicles without harness horses (or oxen), and of a new construction, of which the wheels turned of themselves around their axles, owing to an ingenious mechanism." This passage is an uncut gem of the very first water. The Emperor Commodius (*sic*) is excellent, and it is difficult to say whether the Latin with its obvious misprints or the translation of it is the more grotesque. Smith *minor* in all his glory did not translate like one of these. What we should like to know is from what sources our American contemporary put together this quaint farrago of absurdities.

◆

TRAMWAYS AND THEIR OBLIGATIONS.

THE decision of the House of Lords in the case of Dublin United Tramways *v.* Fitzgerald to the effect that the Tramway Companies are bound to sand their tracks when the tracks would otherwise be dangerous, appears to be resented by the Companies and the electrical press which they support. It will be welcomed by automobilists and the public generally. The degree to which tramlines interfere with traffic generally is exceedingly trying in all suburban areas. It is more than trying to the automobilist. It is but too often exasperating. We last week commented with satisfaction on the circumstance that a private individual had been successful in a suit against one of these companies for damages, for an accident caused by the manner in which certain rails were permitted to protrude above the general level of the roadway. This judgment, in conjunction with the decision of the House of Lords above referred to, will go a long way towards inducing the tramway companies to respect, to some small extent, the rights of other users of the road. They have been allowed to monopolise so much of it—to contribute so greatly to congesting still further the already over-congested city traffic, that it is with nothing but satisfaction that we observe their inclination to render the roads impassable for all but themselves has been met by so independent and common-sense an attitude on the part of our supreme judicial tribunal.

◆

TRACTION ENGINE OR LIGHT LOCOMOTIVE ?

A CASE of considerable importance to manufacturers and users of steam lurries was decided at the last Petty Sessions at Slough. One of the well-known Straker steam lurries had been sold to a customer resident in that district, and used continuously for some time by him. The police prosecuted the owner, Mr. J. Bray, of Marlow, on the ground that as his lurry emitted visible vapour, it was not entitled to enjoy the benefits of the Act of 1896, and they proceeded against the owner consequently for not having a traction engine licence under Section 9 of the Act of 1898. The prosecution was really at the instance of the Bucks County Council, who instructed (and paid) Mr. Wilkins, of Aylesbury, to appear for the prosecution.

It was maintained by Mr. Staplee Firth, for the defence, that the Straker lurry was entitled to come under the saving clause of the 1898 Act as being a light locomotive in the sense of the 1896 Act, that is to say, as being "so constructed that no smoke or visible vapour is emitted therefrom except from any temporary or accidental cause." Mr. Firth argued that the visible vapour stated to be diffused by the Straker lurry was due either to a temporary escape from the safety valve or to a temporary employment of steam in the fire-box to increase the draught. After argument at great length (it took several hours in fact) the Bench dismissed the case. The matter is of considerable importance to all users of steam lurries, and their number is happily daily an increasing one. Needless to say, the decision of one Petty Sessional Court does not form a precedent binding on others, but still the failure of a case of this kind certainly discourages the bringing of others, just as its success would have encouraged further prosecutions. Of course a practically identical point has been brought up before in the case of light steam cars, and has led to the dismissal of the cases, but the case of a lurry evidently did not appear to the affiliated police and County Council quite on all fours with these, so we congratulate both Mr. Firth and his client Mr. Bray (as also incidentally all other users of steam lurries) on their successful defence.

◆

MORE EQUINE ECCENTRICITY.

THERE is no doubt that the horse when hitched in front of a vehicle which he pulls by some sort of flexible connection is an exceedingly dangerous form of traction. We recently chronicled the savage onslaught made by a horse (with brougham) upon an unoffending motor car on the Thames Embankment. An even worse outrage was committed by one of these quadrupeds on Tuesday last in front of Frascati's Restaurant. It chose to be frightened, forsooth, because a piece of paper blew across its face. Of course it at once got beyond the control of the driver, the vehicle to which it was attached collided with a truck and three ladies were knocked down and seriously injured by the equine gymnastics—one of them so seriously that she subsequently succumbed to her injuries. The horse is an excellent servant under a saddle. He is splendid across country, and as great a lover of sport as the best of us, but he evidently was not intended to drag vehicles on wheels. He is capricious, superstitious, and desperately unreliable, and often chooses to be frightened without any cause at all. Some day this form of traction will be suppressed by law. In the meantime, however, something might be done to compel drivers of horse-drawn vehicles to provide them with adequate brakes. At present they as often as not have none at all. Seldom are the brakes adequate to pull up a bolting horse. Attempting to pull him up by the reins is an absurdity. It simply transfers the draw-bar pull from the traces to the ribbons. Every motor car has sufficient brake power to hold it on the steepest hill. Every horse-drawn vehicle ought to have brake power sufficient to stop the capers of the most panic-stricken horse—even if it does so by throwing the horse down, as it might in the case of a hansom !

◆

TO GIVE THEM EYES!

THE County Council are bringing in a bye-law for 1904 prohibiting the use of vehicles, unless from the driving seats an uninterrupted view can be obtained of the street in all directions. This is intended to prevent the use of vans so covered in that the drivers cannot see behind, and so make a habit of turning suddenly across a street, careless as the gods of what may be behind them. The idea is excellent, but some provision should be made for compelling the drivers to look behind, and punishing them if they do not attend to the result of their observations.

◆

Bright ran thy line, O Galloway !
Through many a far-famed sire,
So ran the far-famed Roman way,
So ended—in a mire.

Robert Burns.

THE LATEST LOCOMOBILE STEAM CARS.

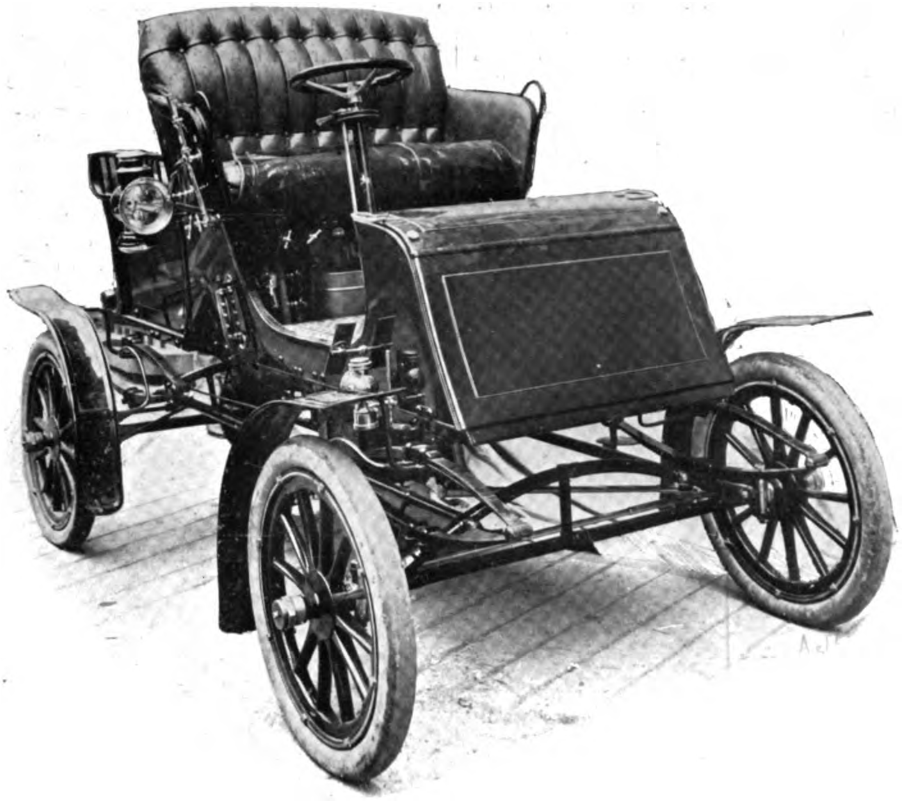


FIG. 1.—The new 10-h.p. Locomobile Dos-a-Dos.

It is probably not too much to say that the Locomobile is more widely known throughout the world than any other make of automobile. The manufacturers can justly lay claim to having been the pioneers of the light steam car, and to having done more than any other Company in popularising this type of vehicle. These machines are essentially an American production, that country having up till now held its own with them in just the same manner that English manufacturers have maintained their supremacy with heavy steam wagons. Their many fascinating features, coupled with the low prices at which they have been put on the market, have ensured for them a very wide sale in this country, as well as abroad. It is not so very long since they were considered to be mere toys by a large number of English engineers, not a few of whom were inclined to regard them as being dangerous at that. In spite of this, however, they soon showed themselves to be thoroughly serviceable and safe machines, in which the advantages of a steam over a petrol system could be taken full advantage of. They are too well known to our readers for it to be necessary for us to specify their attractive characteristics, for it may almost be said that the majority of people think they recognise a steam car in any light automobile which is unusually silent, either when standing or when running.

The Locomobile Company of Great Britain, under the able management of Mr. W. N. Letts, have displayed the same enterprising spirit in this country that the manufacturing concern have in America, and the organisation of the business is particularly complete. They have already sold about a thousand Locomobiles over here, and not only have remarkably well equipped headquarters in London, but have a large depôt in Liverpool and agents in several of the large cities in the kingdom. The Company's London premises in Kensington cover a considerable amount of ground, and not only include two large show rooms, but provide a riding school in which novices are taught the management of their cars, a garage for the convenience of resident owners in the neighbourhood, well-arranged stores in which a large stock of all parts are kept, repair shops suitably equipped for every emergency, testing departments both for complete cars and for the engines separately, and a systematically arranged packing department. Our illustrations give a small idea of the extent of the place, for the Company have provided a side road from the main street which leads both to the garage and to the store departments, hydraulic lifts being installed for taking the customers' vehicles down to the former, and for taking goods and cars to and from the stores and repair shops. All the various departments communicate with one another, and the premises have been laid out to the best advantage.

The garage affords accommodation for about a hundred cars, and is fitted with a washing room and all other conveniences. The riding school is quite a large and lofty building, of which a good idea can be obtained from the photograph which we give (Fig. 8*c*). In the testing room, on the ground floor (Fig. 8*a*), six or eight cars can be simultaneously attended to, and the necessary benches are suitably fitted up for facilitating any work which may be undertaken. At times it has been found necessary to build entire vehicles here, this being a simple operation from the parts which are at all times in stock. The fitting shop, which is below ground (Fig. 8*b*), is of even larger size, and has a machine tool shop and a forge arranged in conjunction with it. One part (Fig. 8*d*) is specially arranged with a bench for re-tubing and testing boilers, hydraulic pressure being at all times available, and the boilers can be subjected to a very high pressure. In the engine testing room (Fig. 8*e*) provision is made for fixing the engines in place and running them under steam from their own boilers. The power of the engine can be measured by a dynamometer, a chain being used for connecting the engine with the countershaft carrying the brake-wheel. All engines are tested here before they are sent out, and the trials they undergo are considerably more severe than those to which they are likely to be subjected under ordinary working conditions. Throughout the place, expeditious and systematic methods, which are unfortunately more peculiar to America than to England as yet, are noticeable, and a visit there cannot fail to impress the would-be purchaser with the care which has been taken to study his interests. The Company can not only supply any required part of a Locomobile at a moment's notice, but maintain a large staff of specially trained mechanics in readiness to be sent to any part of the country without delay.

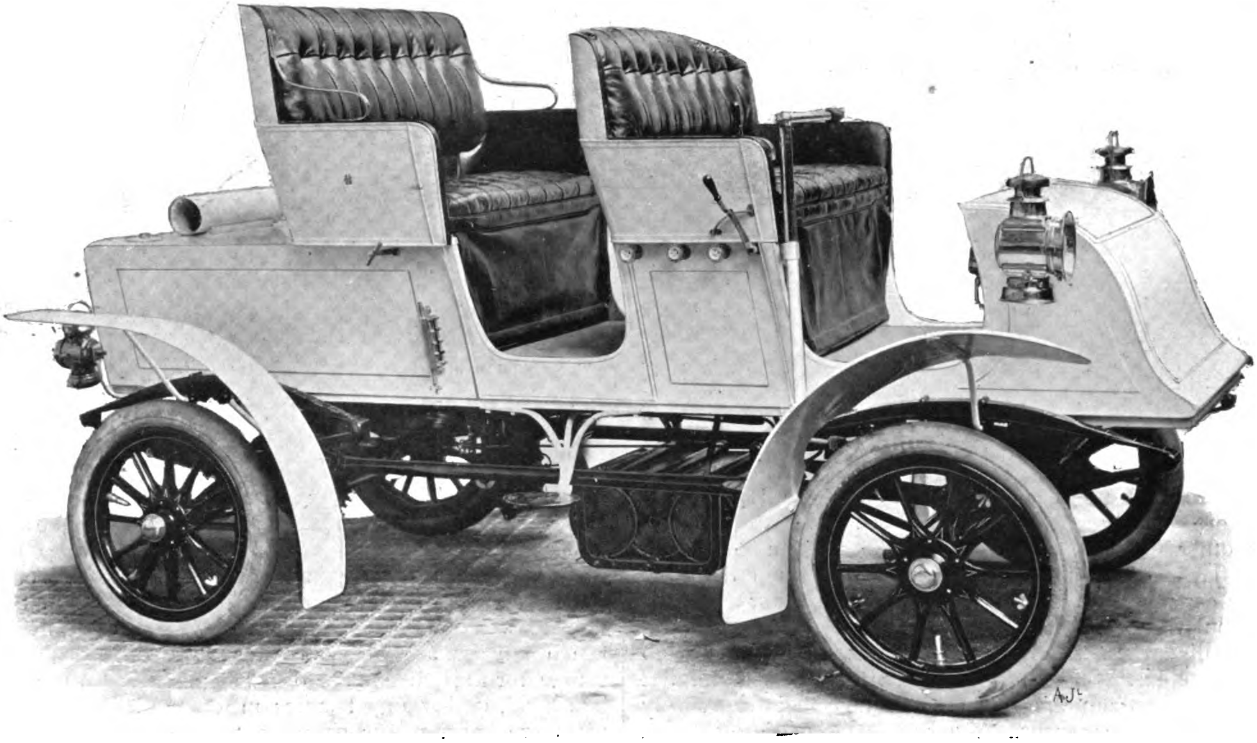


FIG. 2.—The new 10-h.p. Locomobile Surrey.

The Company have this year introduced larger types of car, and considerably stronger construction is found throughout these vehicles. Hitherto the policy pursued has been to supply serviceable vehicles at as low a cost as possible, and therefore many of the refinements which are incorporated in these larger cars have been absent previously. The system remains the same throughout, with the one exception of discontinuing the use of a torch for heating up the burner. It is some little time since we described them fully, for the makers have not found it necessary to alter their design materially from the first. It will, however, be remembered that the fire tube boilers, which are 14 inches in diameter and have 290 tubes, are made with copper shells, copper tubes and steel tube plates, the shell being wound round with steel wire. The petrol feed to the burners is regulated by an automatic diaphram valve which is set to shut off the fire at the desired steam pressure. The feedwater pump is driven by the engine, and the driver regulates the quantity of water delivered into the boiler by adjusting a by-pass valve. The petrol is carried in the tank under pressure, an air tank maintaining comparative constancy of pressure, and a hand pump enabling the driver to obtain the necessary pressure. An auxiliary hand pump for feeding water into the boiler is provided, and the water gauge has a water column and try-cocks.

The various cars now manufactured by the Company are either fitted with the usual 5½-h.p. equipment, with 6½-h.p. machinery, or with this year's 10-h.p. engine and boiler, thus making three types of different power. Each of these types is supplied with a variety of bodies, and consequently the Company have a large selection of cars altogether. One of their latest forms of body is an uncommonly neat brougham, which is seen in our frontispiece.

As we have on more than one occasion pointed out, the actual horse power available on a steam car varies considerably according to circumstances, and can, for short periods, be largely in excess of that which can be maintained continuously with a steady load. The available reserve of power in the Locomobile largely depends upon the pressure at which the diaphragm valve is adjusted to shut down the fire, and although this adjust-

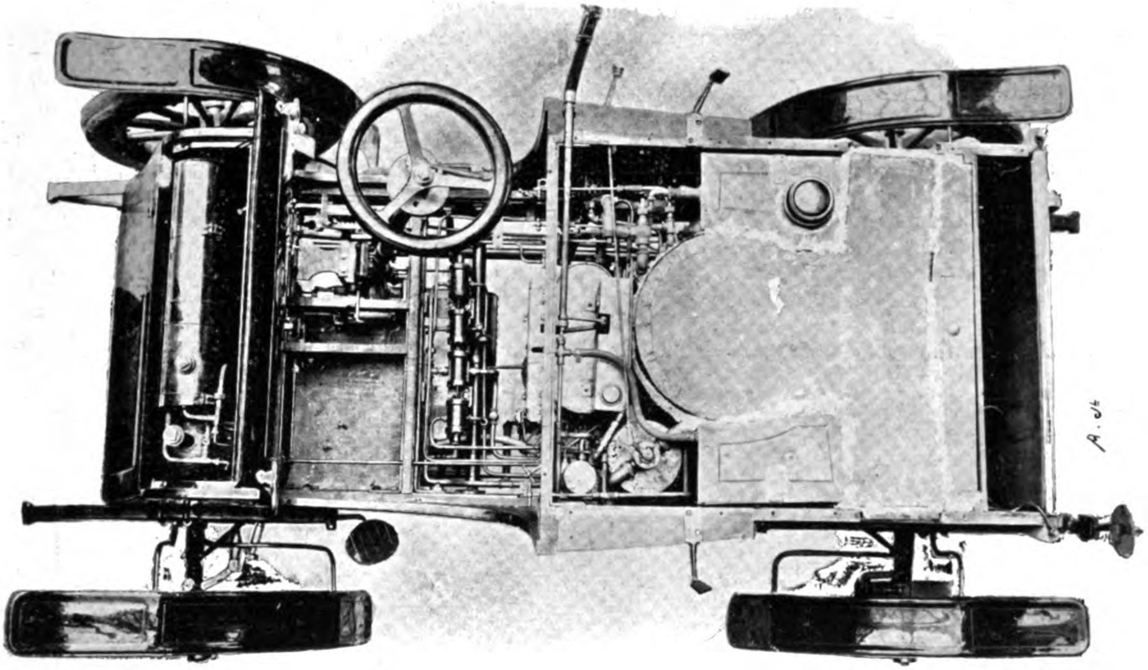


FIG. 3.—Plan view of 10-h.p. Dos-a-Dos, with seats removed.

ment should on no account be disturbed by the owner of the car, yet it enables the Company to render their vehicles specially suitable for the particular district in which they are to be used, and for the duties which they are to perform.

Two of the new 10-h.p. cars were first shown to the public at the recent Exhibition at the Crystal Palace. Photographs of these are given in Figs. 1 and 2, the former being a Dos-a-Dos with wheel steering, and the latter a 4-seated Surrey with unusually long wheel base and tiller steering. Both these vehicles are fitted with the new 10-h.p. engine and with a 16-inch boiler having 340 tubes. They are provided with 28-inch wooden wheels, shod with 3-inch

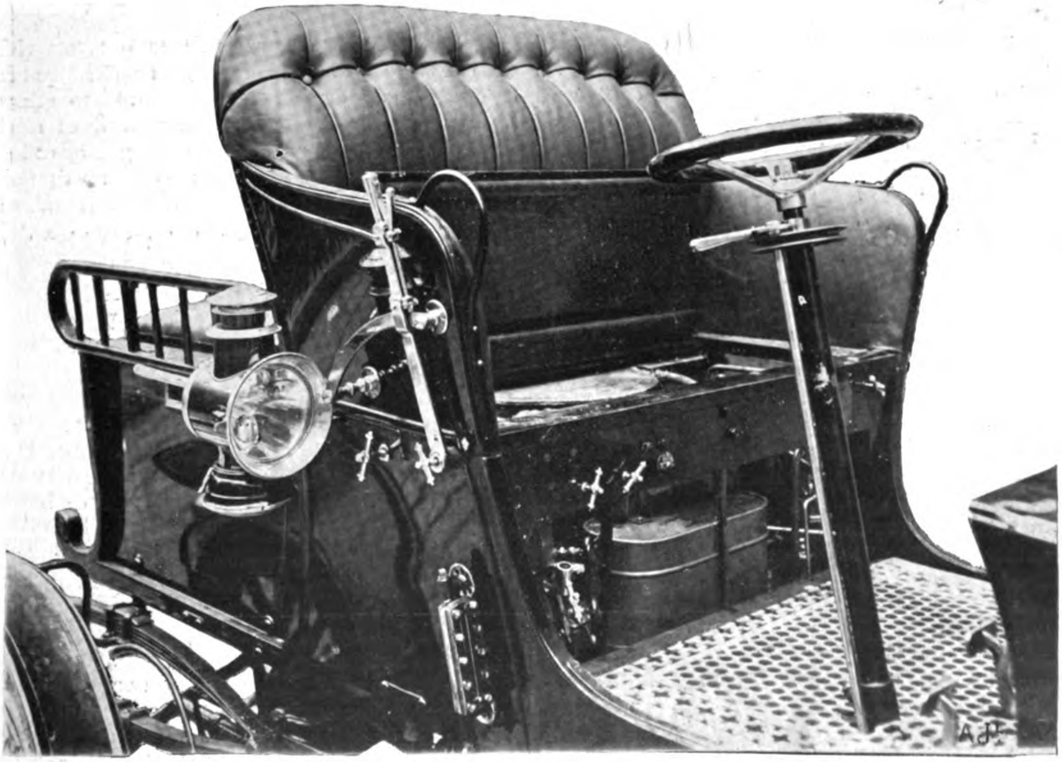


FIG. 4.—The 10-h.p. Dos a-Dos, with seat and front board removed, showing Steering Pillar and Regulating Levers.

pneumatic tyres. The Dos-a-Dos accommodates four people, but the back seat is so made that it can be folded up when not in use. It has a wheel base of 6 feet 6 inches, and the track is 4 feet 6 inches. A plan view of it with the seats and floor removed is seen in Fig. 3. The controlling levers and the steering pillar are clearly shown in Fig. 4, and the construction of the tubular underframe with the reaches and rear-springs is visible in Fig. 5, which is a photograph of the rear-axle. The chief features of the car, apart from the wheel steering, are that the engine is fitted with an aluminium crank-chamber and with roller bearings, that four large band brakes are mounted about the rear-axle, and that numerous accessory fittings are provided which are not included in the smaller standard vehicles.

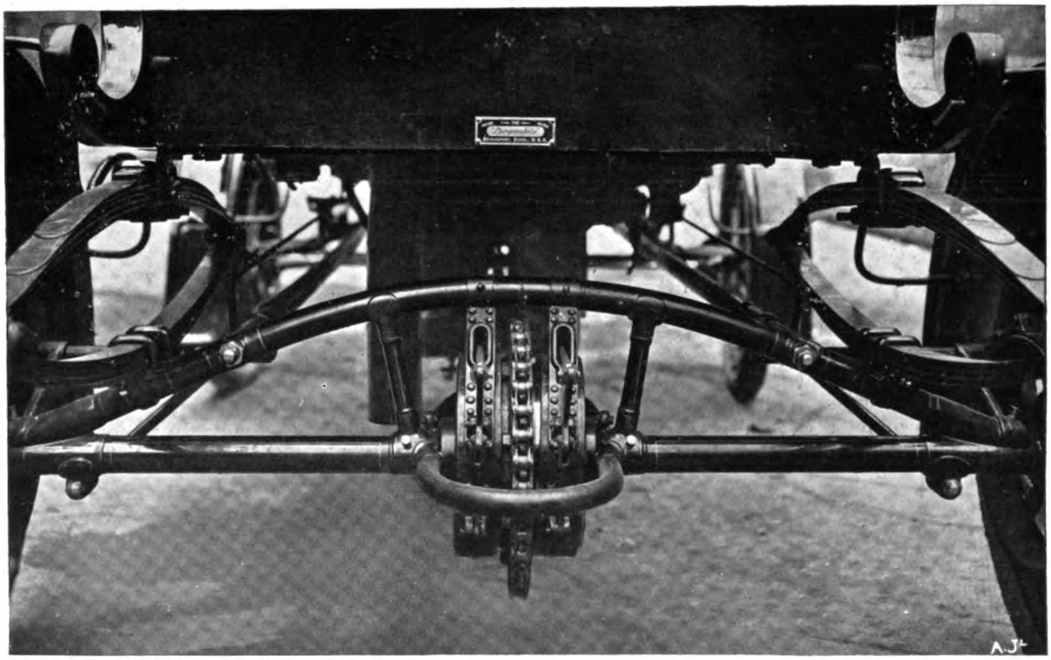


FIG. 5.—Rear Axle of 10-h.p. Locomobile Dos-a-Dos.

The main frame is made of wood, and the boiler is carried by steel transverse members, the front one of which also has bearings bolted to it for receiving the engine. The steam and exhaust pipes leading from the cylinder casting form trunnions for supporting the engine in place; they fit into the bearings above referred to. The engine itself is seen from different points of view, both with the crank-chamber in place and with it removed in Figs. 6 and 7. It is of much the usual type, having two double-acting high pressure cylinders which are lagged outside and enclosed in a metal casing, A. The cylinders have a bore of three inches, and the stroke is four inches. The crossheads are provided with large rollers, A^{1}, which slide in grooved guides provided for them. The connecting rods have roller bearings at their big ends and the crankshaft is also carried in roller bearings in the engine frame. The reversing gear is of the link-motion type, and the slotted quadrants are thrown over by the projecting lever, B, which is connected with a hand lever seen in Fig. 4 on the right-hand side of the body. All the small parts are made from steel drop forgings, and the bearing surfaces are of ample dimensions. The driving sprocket, B^{1}, is, as usual, fixed centrally to the crank-shaft. The crank-chamber is made in four pieces, one of which, C, has a hinged inspection door, C^{1}. The two upper parts, C and C^{2}, are fixed together, and separate base castings, C^{3}, fit up against them and enclose each of the cranks. The case is dust-proof, and allows the moving parts of the engine to run in oil. The feedwater pump, E, is bolted outside the casting, C, and is operated by a swinging lever, E^{1}, which is pivoted to the bracket holding the pump, and is connected at one end to the plunger and at its inner end by an intermediate rod, E^{2}, to one of the crossheads. The piston rods and the valve spindles pass through stuffing boxes which are fitted with projecting levers, A^{2}. Small ratchets are fitted between the levers and the stuffing boxes so that the packing in the latter can be tightened up without employing a spanner for the purpose, by merely moving the levers backwards and forwards. The engine is secured in place in the car by the steam and exhaust pipe fittings, A^{3}, these being the trunnions above referred to. The only other fixing is that provided by the distance rod, D, (Fig. 7), which connects the crank-chamber with the back axle. The distance rod has a swivel joint, D^{3}, between it and the fork at its rear end, and an adjustment screw, D^{1}, and a ball joint, D^{2}, at its forward end. It is fixed to the engine by the bolts, D^{6}, and to the back axle by the bolts, D^{4}. When in place it passes along between the two sides of the chain, K. The various parts of the engine are lubricated by the Company's octopus lubricator, L, fixed above the cylinders. The feed of oil from it is controlled by a main cock, L^{1}, and oil is led by six branch pipes, L^{2}, so that it flows upon the cross-head rollers, and the guides for the valve rods.

The burner, F, is shown in two positions in Fig. 7, where it will be noticed that two vaporising tubes, F^{1}, pass across it from the starting heater box, G, and that the other ends of these tubes are joined together by a connecting piece having removable plugs, F^{2}, arranged so that the

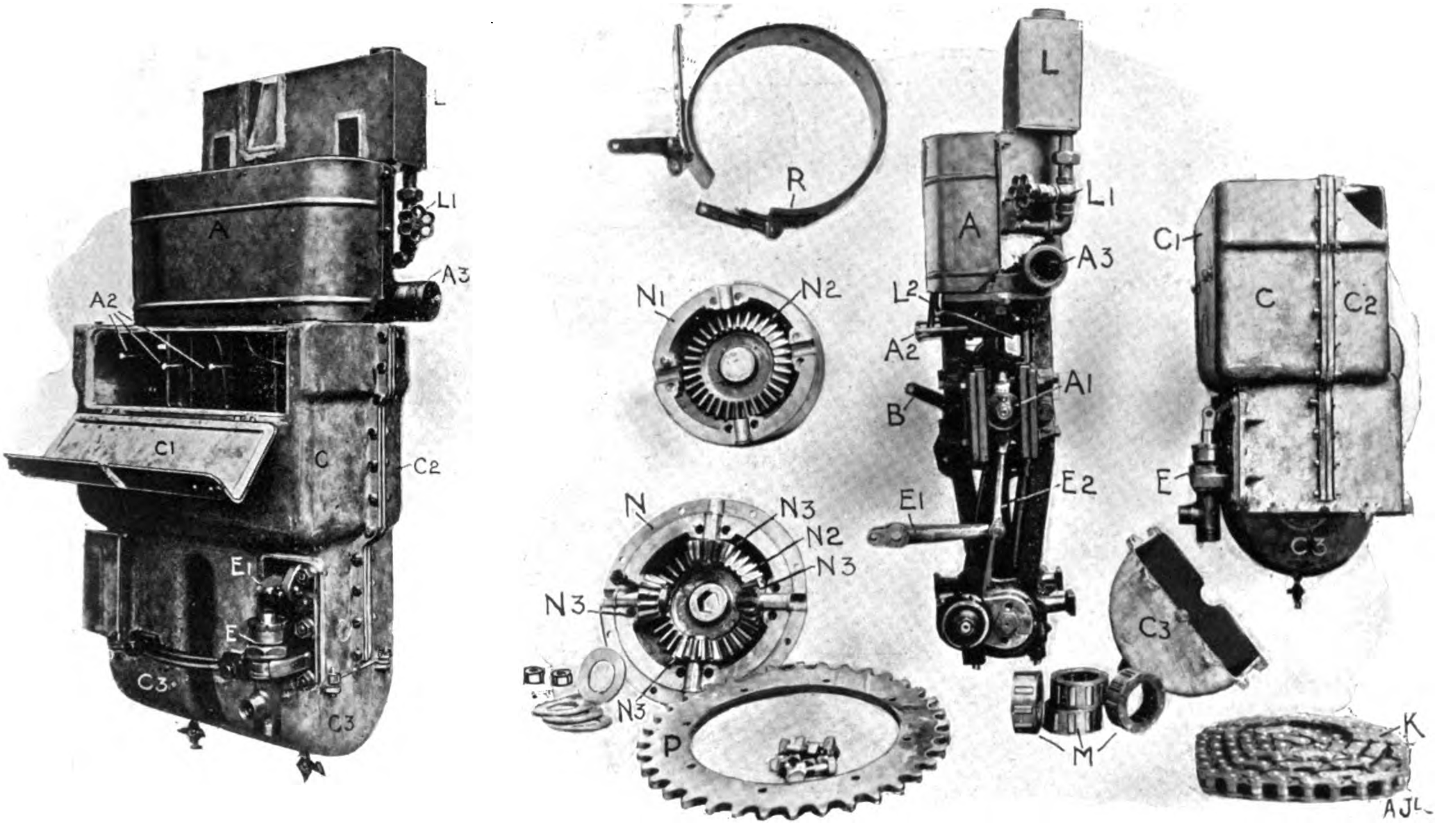


FIG. 6.—The Engine and other parts of 10-h.p. Locomobile Dos-a-Dos.

tubes can be cleaned out without disturbing them. The starting arrangements are simple, and consist of a small vaporiser tube in the box, G, and of a petrol lamp, which can be lighted in order to heat up the small vaporiser. The burner is fitted with the usual diaphragm valve, H, which is connected with the steam pressure in the boiler through the pipe connection, H¹. This valve does not entirely shut off the petrol feed, but allows a certain minimum quantity to flow past it so as to provide a pilot flame. The burner fits down into the casing, J, which is so made as to

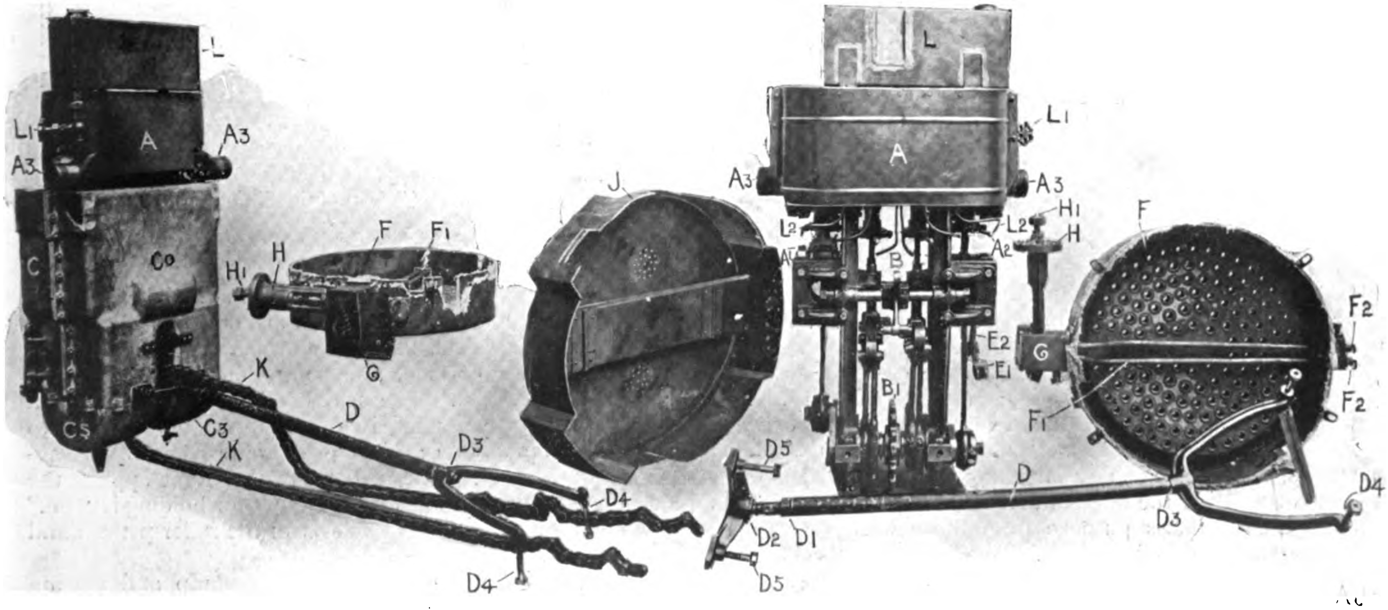


FIG. 7.—The 10-h.p. Dos-a-Dos. Two views of the Engine, of the Burner, and of the Adjustable Distance Rod.

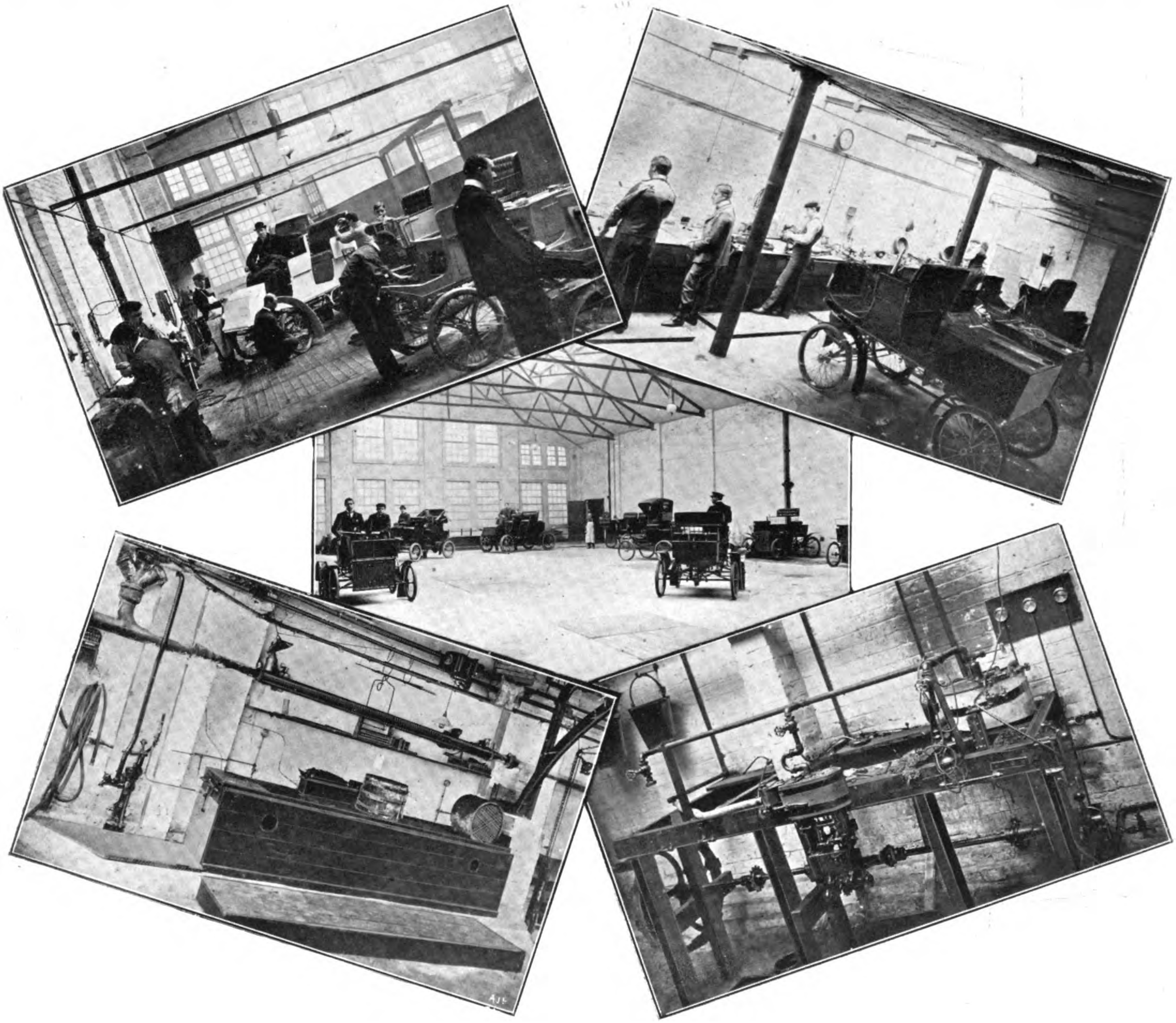


FIG. 8.—(*a*) The Testing Department. (*b*) Part of the Fitting Shop. (*c*) The Riding School. (*d*) The Boiler Repair and Testing Shop. (*e*) The Engine Testing Bench.

take the air supply in at the side instead of at the bottom; any risk of blowing out in a high wind is in this way avoided. The burner is fixed in place beneath the boiler in the usual way. The differential gear is well designed and strongly made; it is shown in pieces in Fig. 6, where N and N^1 are the two parts of the external shell. They carry four steel pins upon which the planet wheels, N^3, revolve. The large sprocket, P, registers over, and is bolted to, the one half, N, of the shell, separate bolts being used for this purpose from those which secure the two parts of the shell together. The concentric bevel wheels, N^2, have hexagonal and tapered holes in their hubs, the two parts of the live axle being correspondingly shaped to fit into them. The live axle is carried in four roller bearings, M, one near each end of each shaft. The shell of the differential forms two brake drums, one on either side of the sprocket wheel, P. Brake drums are also fixed to the hubs of each wheel, and four double-acting brake-bands, R, are fitted. The two bands on the differential are simultaneously applied by one foot-pedal and the two side brakes by another; both pairs are provided with compensating devices. The pedal on the right applies the side brakes, and is fitted with a ratchet for holding it "on." The chain fitted to this vehicle is of the roller pattern and of large size.

This car is fitted with a steam air pump and a steam water pump, which are placed horizontally beneath the floor in front of the driver's seat; either of these can be brought into use by moving a small lever just behind the dash to the right or to the left, when the pressure in the fuel tank will be increased, or water will be forced into the boiler, according to the direction in which it is moved. The steam air pump allows a greater quantity of petrol to be carried on the car, because the air tank may also be filled with petrol, and yet the pressure upon the fuel can be maintained without much trouble to the driver. Although the pressure on the fuel will soon begin to fall if both tanks have been filled, yet it is only necessary for him to bring the steam pump into operation occasionally and thus renew the pressure. This pump can also be used for inflating the tyres. The steam water pump is a very great convenience in the event of anything happening to the ordinary feed pump, as it restricts the use of the hand-pump to those times at which there is no pressure in the boiler. These automatic steam pumps are only provided as extras on any but the 10-h.p. vehicles, with the exception of some of the Company's 6½-h.p. cars, where the air pump is in some cases fitted.

The speed of the car is normally regulated by the throttle valve, and this is controlled by a small horizontal lever on the steering pillar. The reversing lever moves over a quadrant provided with three forward notches and one "reverse" notch. The boiler is fitted with a super-heater of the Strickland form, the steam being led through it on its way from the boiler to the throttle-valve. The superheater is made out of steel tubing, and although only some 6 feet in length, is found to effect an economy both of water and of petrol of about 25 per cent.; it is placed between the burner and the boiler. The water guage is of the Klinger well-known pattern, which is not ordinarily fitted on the small vehicles. The petrol tank holds about 9 gals., which is sufficient for a run of about 55 miles, and the water tank holds 28 gals., sufficient for about a 30 mile run. A neat tool-box is provided in the front. The car which we examined was fitted with a Rochester Pony lubricator which forces the lubricating oil into the cylinders, and the wheels of this vehicle were shod with the Fisk pneumatic tyre, of which we give a sectional illustration in Fig. 9. Its chief features are that it is held to the rim mechanically—not by air pressure, that the air chamber is entirely outside the rim holding the tyre, and that a flat rim is employed with it. The outer cover is made with projecting beads as shown, and they are held down upon the rim by wedge-shaped clips, which are secured in place at intervals by bolts, as seen. It is said to be extremely resilient, and to be easy to remove and replace.

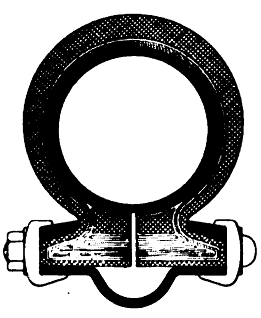


Fig. 9.—Cross-Section of the Fisk Tyre.

This interesting and well-built Locomobile has been put on the market at £325 and will doubtless meet with a considerable demand in this country.

The Locomobile Company have also made some minor improvements in their smaller vehicles, and are in certain cases enclosing the moving parts of the engines in sheet metal cases. In general respects, however, these vehicles remain unchanged.

As already announced in our columns, the Company are about to introduce the Waverley electric vehicles into England, and will shortly receive a large consignment of them from America. They intend to equip a portion of their premises as a charging station, and with the facilities at their command should be able to meet the requirements of a large number of residents in the West End for electrical vehicles for use in London. We do not propose to deal with these machines at the moment, however, and shall leave any further reference to them to a future occasion. That the Locomobile Company will meet with considerable success with them almost goes without saying, for the manner in which their steam business has been handled is sufficient guarantee of the commercial ability they possess.

* * *

The Committee appointed at the motor cycle trade meeting, held at the Automobile Club on February 11th, to prepare a programme for the Association to be submitted to a full meeting of the motor cycle trade, have called a meeting for March 4th, at 4 p.m., at Anderton's Hotel, Fleet Street. It is suggested that the Association should be called the Motor Cycle Trades Association, Limited (limited by guarantee), and should represent all branches of the trade, whether directly or indirectly connected. To support one Show only per annum will be one of the direct objects of the Association, and at the meeting on the 4th the question of appointing officers, electing committees, determining the amount of entrance fees, subscriptions, &c., will be dealt with.

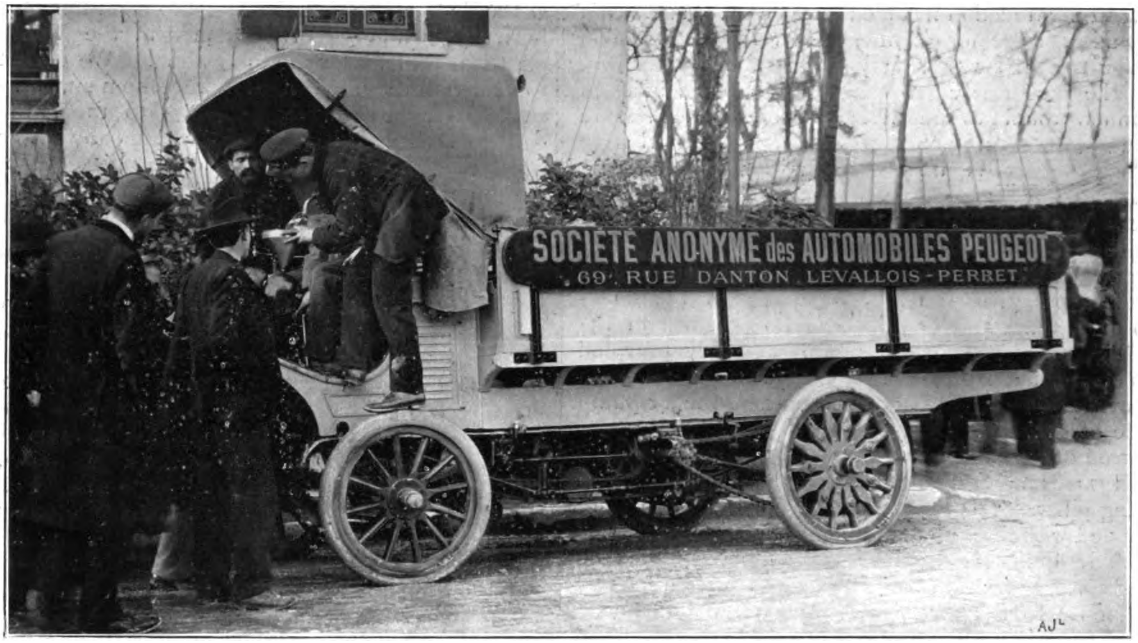
The Scottish Automobile Club (Western Section) have issued the following interesting programme of runs, &c., for the ensuing season:—

March 28th.—Ayr (Station Hotel).
April 25th.—Callander (Dreadnought Hotel). Joint Meet with Eastern Section.
May 13th and 14th.—Glasgow to London Non-stop Trial.
May 23rd.—Lanark and Hill-climbing Competition on Kirkfield-bank Hill jointly with Eastern Section.
June 13th.—Tarbet.
July 4-10.—(Provisional) Irish week, Gordon-Bennett Race.
August 8th.—Biggar.
September 19th.—Aberfoyle.
October 17th.—(Provisional) "Anniversary" Run—Dunblane cars meet in Glasgow at noon.

At a meeting of the Section on Monday evening, March 9th, Mr. Wm. Weir, a member of the engineering firm of G. and J. Weir, Cathcart, N.B., is to read a paper on "The Possible Developments of Automobiles and Automobilism."

The Society of Motor Manufacturers and Traders at a meeting held at the Hotel Cecil on the 19th instant, Mr. Frederick R. Simms in the chair, resolved that next year's Exhibition shall be held at the Crystal Palace from February 12th (Friday) to 24th (Wednesday), when Parliament will be sitting, being an extension of three days on the Show recently held. It was determined to officially close the Show on each day at 9 p.m. In regard to the proposed Exhibition and speed trial at Brighton, in May, the feeling of the meeting was against a formal Exhibition but in favour of the speed trials being held, the competing cars being on view at the Aquarium afterwards if desired. It was determined that those firms signing a bond binding them to show at no other Automobile Exhibition within 20 miles of London during the year 1904 should be entitled to ballot for the first choice of position at the Exhibition, such ballot to be held early in March.

PARIS FUEL CONSUMPTION TRIALS ORGANISED BY "L'AUTO."


SOCIETE ANONYME des AUTOMOBILES PEUGEOT
69, RUE DANTON LEVALLOIS-PERRET
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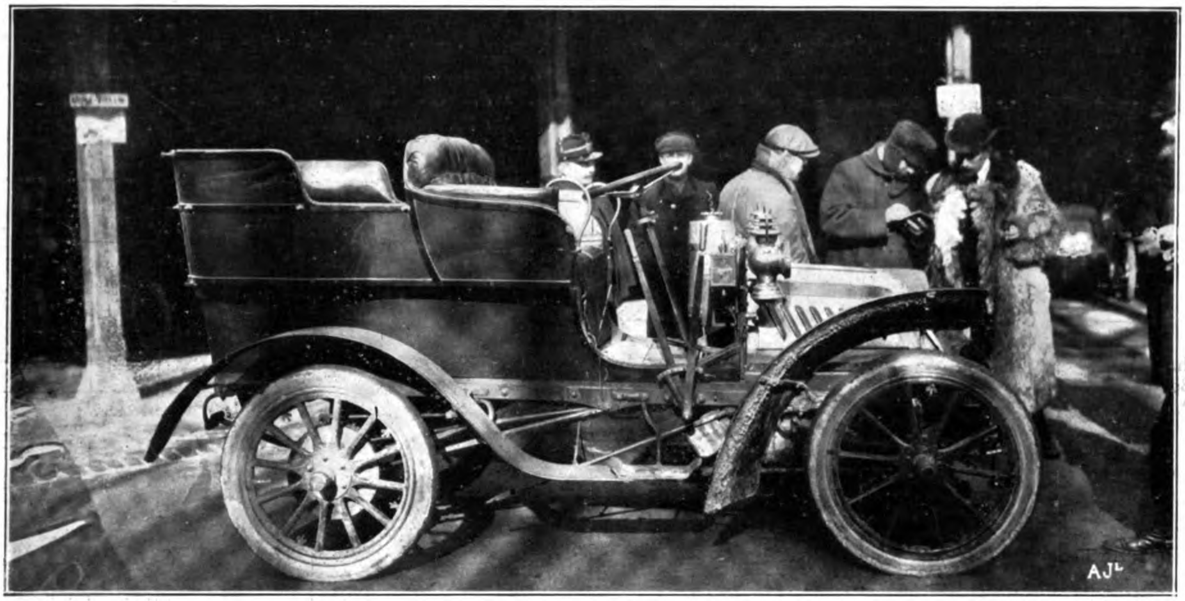
PARIS CONSUMPTION TRIALS.—The 12-h.p. Peugeot Petrol Lurry (No. 35). Winner in the classing by ton-kilometre; Fuel consumption, ·0489 litre per ton-kilometre.

FOR the third year in succession these trials have been organised by *L'Auto.* This year they took place from Suresnes to Essonnes-Corbeil and back—a distance of 100 kiloms.—for the voiturettes and cars; and to Longjumeau and back—a distance of 60 kiloms.—for the industrial vehicles. Altogether there were 56 entries, and of these 40 started, 38 covering the full course. Although the entries were less than last year, this is accounted for by the elimination of the categories for motor cycles and bicycles. The jury comprised MM. G. Forestier, the Brothers Longuemare, Périssé, Leprêtre, Famechon, and Georges Prades. At the last moment the Minister of Agriculture came forward with the offer of a gold medal for the first vehicle using alcohol as a fuel, this award falling to the 6½-h.p. Peugeot light car (No. 32). Three other vehicles used a 50 per cent. mixture of alcohol, but otherwise different makes of "essence" were employed by the competitors, the chief being Leprêtre. There was a double classing, viz.:—(1) By weight in categories, the gross consumption of fuel determining the order of merit. (2) A general classing by ton-kilom. consumption. The gradual reduction of the amount of fuel consumed per ton-kilom.

PARIS CONSUMPTION TRIALS.—The 6½-h.p. Peugeot Light Car (No. 33). Winner in Class II, and Third Prize in the classing by ton-kilometre. Mdme. Lockert, of *Le Chauffeur*, was Observer on this car.



Paris Consumption Trials.—One of the 10-h.p. Chenard and Walcker Cars (No. 16). Winner in Class III; Fourth Prize in the classing by ton-kilometre; and Winner of *La France Automobile* Medal for the first "car" carrying four passengers.

by the winning vehicles year by year is noteworthy, as will be seen by the table we publish, which was prepared by *L'Auto*. The first general prize falls this year to a Peugeot lurry, which is shown in one of our illustrations, with a consumption of ·0489 litre per ton kilom. This house also secured third and seventh places with two light cars, (Nos. 33 and 32), the first of which carried Mdme. Lockert for observer, and which is shown just starting from the depôt. These three cars also carried off the industriel "Prix d'honneur" for the group of three vehicles, designated beforehand, scoring the lowest average fuel consumption. In their case it works out at 0·05643 litre. The Bardon wagon (No. 26), a photograph of which we give, gained a second place with ·0496 litre, No. 25 of this make coming fifth with ·0592 litre. Chenard and Walcker cars (Nos. 16 and 17) take fourth and sixth places with ·0542 litre and ·0614 litre respectively, this house also securing first prize in Class 3, by weight, in addition to two or three other special prizes. No. 16 we reproduce, and all three competing cars of this make are shown in another view on page 235.

The full results are given in our tables.

The prizes announced are:—

For Classing by Category.—Class I.—1st, De Dion-Bouton (No. 41); 2nd, De Dion-Bouton (No. 42); 3rd, De Boisse (No. 31).

Class II.—1st, 2nd, and 3rd, Peugeot (Nos. 33, 32, and 34). No. 32 also gains silver medal for first vehicle in its class employing alcohol.

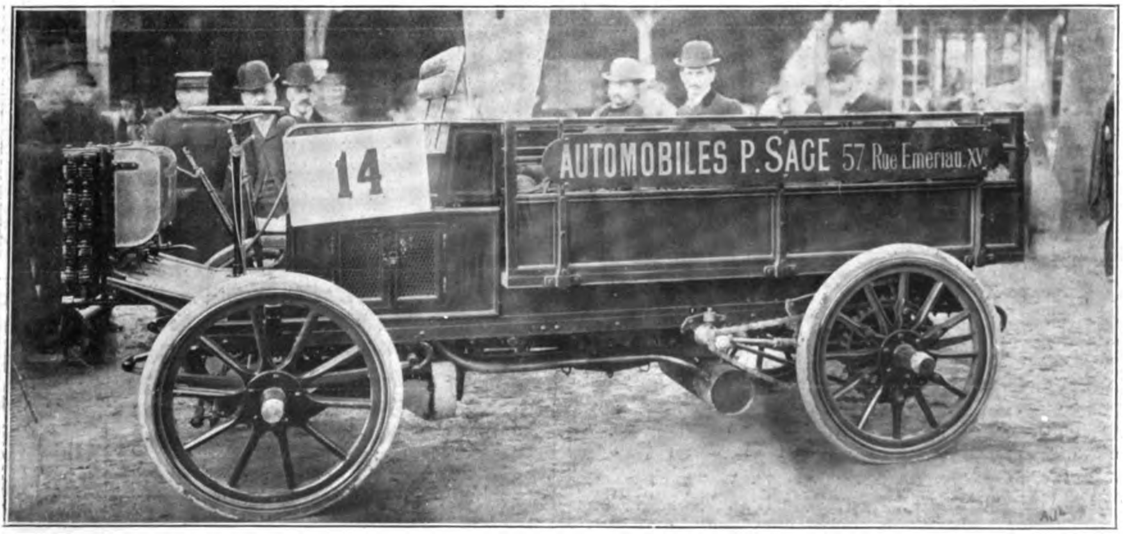
Class III.—1st, Chenard and Walcker (No. 16); 2nd, Bardon (No. 23); 3rd, Chenard and Walcker (No. 17); 4th, Bardon (No. 14). Also silver medal to Hurtu (No. 40), for alcohol.

Class IV.—1st, Bardon (No. 25); 2nd, Mors (No. 19); 3rd, Mors (No. 22).

Industrial Vehicles.—Class I.—1st, Bardon (No. 26); 2nd, Peugeot (No. 35); 3rd, Sage (No. 14).

Class II.—1st, Gillet-Forest (No. 1); 2nd, Prunel (No. 54).

For General Classing by Ton Kilom.—1st, Peugeot (No. 35); 2nd, Bardon (No. 26); 3rd, Peugeot (No. 33); 4th, Chenard and Walcker (No. 16).



Paris Consumption Trials.—The 10-h.p. Sage Petrol Lurry (No. 14).

The Special Medals in the Ton Kilom. Classing are secured as follows:—

Gold: Peugeot, for the carburettor used on winning car; Leprêtre, for the "essence" used; Pessonneaux, as driver; and Peugeot lurry, for cheapest working, having regard to the cost of fuel.

Gold (Minister of Agriculture): Peugeot light car (No. 32), for alcohol.

Order of Merit by Classes According to Fuel Consumed over 100 Kiloms.

Official No.	Horse-Power, and Make.	Gross weight in kilogs.	Carburettor.	Consumption (in litres). Gross.	Consumption (in litres). ton-kilom.	Time, h. m. s. c.
Class I.—Voiturettes (250 *to* 400 *kilogs.*).						
41	6-h.p. De Dion-Bouton (2)	600	De Dion-Bouton	4·400	0·0733	4 55 44⅖
42	6-h.p. De Dion-Bouton (2)	580	De Dion-Bouton	4·440	0·0764	4 59 49⅗
31	3-h.p. De Boisse (2)	340	Longuemare	5·500	0·160	5 12 9
44	6-h.p. De Dion-Bouton (2)	600	De Dion-Bouton	5·850	0·0975	5 17 26⅖
38	6-h.p. Europeenne (2)	572	De Dion Bouton	11·350	0·216	3 7 22⅕
Class II.—Light Cars (400 *to* 650 *kilogs.*).						
33	6½-h.p. Peugeot (4)	969	Peugeot ...	5·200	0·0536	4 11 22⅕
*32	6½-h.p. Peugeot (4)	900	Peugeot ...	5·720	0·0635	5 25 21
34	6½-h.p. Peugeot (4)	890	Peugeot ...	5·950	0·0668	3 42 17⅘
3	5-h.p. Gillet-Forest (2)	880	Sthenos ...	6·500	0·0738	4 47 39⅗
*11	9-h.p. Automotrice (2)	730	Longuemare	6·720	0·0920	4 20 12
50	8-h.p. Herald (2)	1,640	Longuemare	8·600	0·134	3 26 3⅗
18	12-h.p. Impetus (2)	—	Longuemare	†19·	—	3 59 14⅕
Class III.—Cars (650 *to* 1,000 *kilogs.*).						
16	10-h.p. Chenard and Walcker (4)	1,160	Longuemare	6·290	0·0542	4 29 59⅖
23	5-h.p. Bardon (2)	897	Le Blon ...	6·540	0·07257	5 40 33⅕
17	10-h.p. Chenard and Walcker (4)	1,180	Longuemare	7·250	0·0614	4 18 33
24	8-h.p. Bardon (4)	1,135	S. A. T. ...	7·350	0·0647	4 7 58⅖
2	12-h.p. Gillet-Forest (2)	920	Gillet-Forest	7·700	0·0836	4 25 11⅖
*40	9-h.p. Hurtu (2)	860	Longuemare	7·770	0·0902	5 17 23
15	10-h.p. Chenard and Walcker (3)	920	Longuemare	8·340	0·09067	5 56 26⅖
51	12-h.p. L'Enviable (2)	870	Longuemare	8·800	0·101	5 4 25⅖
39	10-h.p. Hurtu (2)	1,100	Longuemare	9·160	0·0832	3 40 3⅖
37	12-h.p. Herald (4)	1,150	Longuemare	9·700	0·0840	5 57 23⅘
36	12-h.p. Herald (4)	1,175	Longuemare	10·650	0·09064	5 32 40⅕
56	16-h.p. Regina (3)	1,300	Regina ...	10·750	0·0825	5 12 15⅕
49	10-h.p. Abeille (4)	1,200	Abeille ...	11·770	0·098	—
28	18-h.p. Vinot-Deguingaud (4)	—	Longuemare	13·600	—	4 25 50⅖
30	12-h.p. Turcat-Mery (4)	1,360	Turcat-Mery	14·300	0·106	3 16 33⅕
Class IV.—Heavy Cars (*weight over* 1,000 *kilogs.*).						
25	8-h.p. Bardon (2)	1,200	S. A. T. ...	7·110	0·0592	5 3 46⅘
19	8-h.p. Mors (2)	1,205	Mors ...	8·600	0·0713	4 38 56⅖
21	10-h.p. Mors (4)	1,540	Mors ...	11·170	0·07254	5 45 56
22	15-h.p. Mors (3)	1,290	Mors ...	11·430	0·088	4 47 18⅖
20	8-h.p. Mors (4)	1,330	Mors ...	†18·700	0·140	6 2 8

The figures in brackets denote the number of passengers carried.

* 50 per cent. alcohol mixture, all other vehicles used petrol.

† Leaking reservoir.

Silver (*La France Automobile*): Chenard and Walcker (No. 16), for first 4-seated car.

Silver (*Revue des Transports*): Prunel (No. 54), first lurry using alcohol.

The only award in abeyance is the gold medal offered by *La Locomotion* for the first vehicle of standard type run in the trials.

Industrial Vehicles.—Classed According to Useful Load Carried.—60 kiloms.

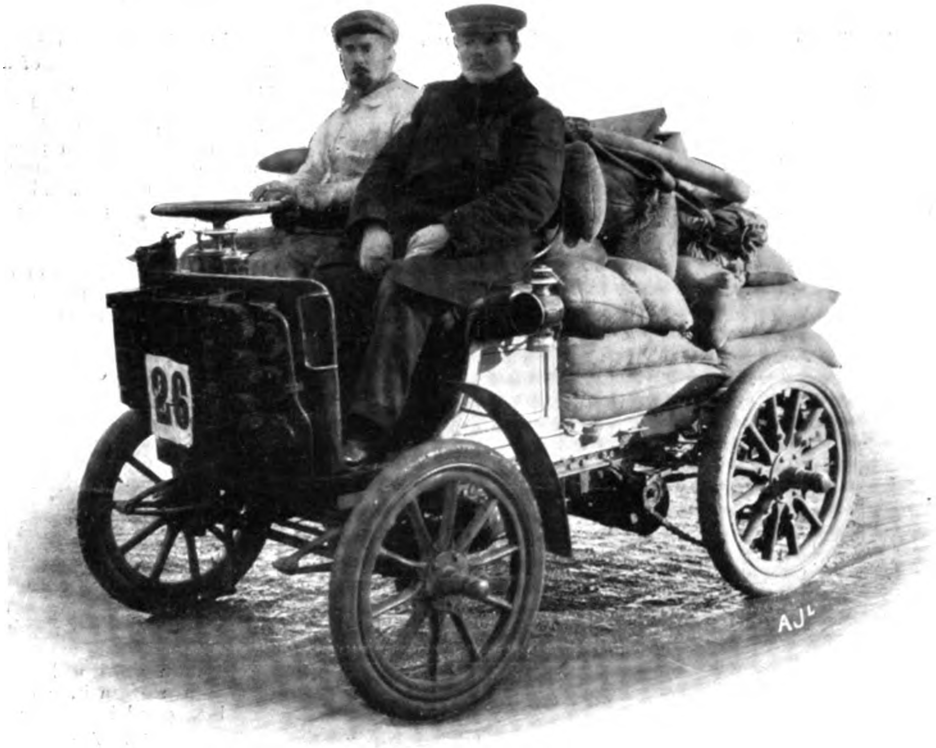
Official No.	Make and H.P.	Gross weight in kilogs.	Carburettor.	Useful weight carried, in kilogs.	Consumption. Gross.	Consumption. Per ton useful load, for 60 kiloms.	Time Occupied. h. m. s.
Class I.—*Vehicles transporting less than* 1 *ton.*							
1	6-h.p. Gillet-Forest	1,660	Sthenos	910	8·700	0·0873	5 28 36⅕
*54	8-h.p. Prunel ...	1,310	Longuemare	525	13·610	0·103	5 10 20⅕
Class II.—*Vehicles transporting more than* 1 *ton.*							
26	5 h.p. Bardon .	2,335	Le Blon	1,540	6·960	0·0496	4 39 34⅕
35	12-h.p. Peugeot	4,680	Peugeot	2,900	13·750	0·0489	4 29 27⅕
14	10-h.p. Sage ...	2,575	Abeille	1,364	11·	0·0714	5 39 12⅗

General Classing by Ton-Kilometre.

Order of Merit.	Make and Official No. (in brackets.)	Weight.	Consumption in litres. Gross.	Consumption in litres. Per ton-kilom.
		kilogs.		
1	†‡Peugeot (35)	4,680	13·750	0·0489
2	†Bardon (26)	2,335	6·960	0·0496
3	‡Peugeot (33)	969	5·200	0·0536
4	‡Chenard and Walcker (16) ...	1,160	6·290	0·0542
5	‡Bardon (25)	1,200	7·110	0·0592
6	Chenard and Walcker (17) ..	1,180	7·250	0·0614
7	*Peugeot (32)	900	5·720	0·0635
8	Bardon (24)	1,135	7·350	0·0647
9	Peugeot (34)	890	5·950	0·0668
10	Mors (19)	1,205	8·600	0·0713
11	†Sage (14)	2,575	11·	0·0714
12	Mors (21)	1,540	11·170	0·07254
13	Bardon (23)	897	6·540	0·07257
14	‡De Dion-Bouton (41)	600	4·400	0·0733
15	Gillet-Forest (3)	880	6·500	0·0738
16	De Dion-Bouton (42)	580	4·438	0·0764
17	Regina (56)	1,300	10·750	0·0825
18	Hurtu (39)	1,100	9·160	0·0832
19	Gillet-Forest (2)	920	7·700	0·0836
20	Herald (37)	1,150	9·700	0·0840
21	†Gillet-Forest (1)	1,660	8·700	0·0873
22	Mors (22)	1,290	11·430	0·088
23	*Hurtu (40)	860	7·700	0·0902
24	Herald (36)	1,175	10·650	0·09064
25	Chenard and Walcker (15) ...	920	8·340	0·09067
26	*Automotrice (11)	730	6·720	0·0920
27	De Dion-Bouton (44)	600	5·850	0·0975
28	Abeille (49)	1,200	11·770	0·098
29	Enviable (51)	870	8·800	0·101
30	*†Prunel (54)	1,310	13·610	0·103
31	Turcat-Mery (30)	1,360	14·300	0·106
32	Boyer (50)	1,640	8·600	0·134
33	Mors (20)	1,330	18·700	0·140
34	De Boisse (31)	340	5·500	0·160
35	Europeenne (38)	572	11·350	0·216

‡ Winners in their respective classes. * Alcohol.

† Industrial vehicles. These covered 60 kiloms. only.



Paris Consumption Trials.—The 5-h.p. Bardon Wagon (No. 26). Winner in Class II of Industrial Vehicles, for wagons carrying over 1-ton load; Second in the classing by ton-kilometre.

Comparative Table of Ton-Kilom. Consumption since 1901.

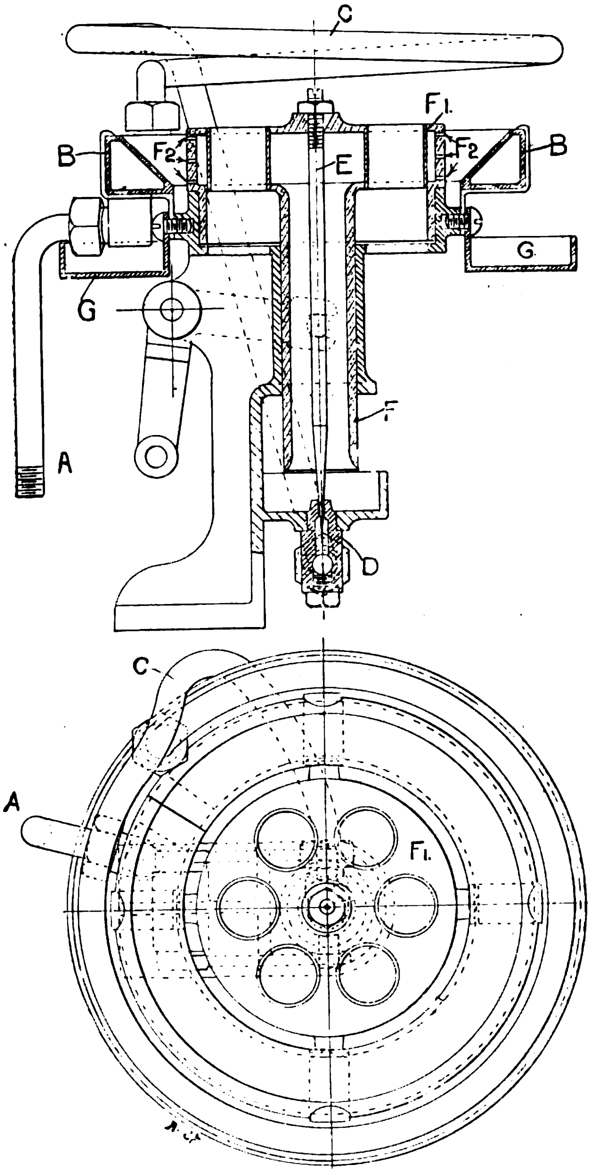
Event.	Voiturettes. 250 to 400 kilogs.	Light Cars. 400 to 650 kilogs.	Cars. 650 to 1,000 kilogs.	Heavy Cars. Over 1,000 kilogs.	Industrial Vehicles Carrying—	
					Under 1 ton.	Over 1 ton.
L'Auto Criterium, 1901	G. Richard 0·171	Delahaye 0·136	G. Richard 0·113	Delahaye 0·09	—	—
Minister of Agricul., 1901 (Alcohol)	G. Richard 0·184	G. Richard 0·110	Bardon ... 0·09615	Delahaye 0·09515	Panhard 0·1056	Sté. Nancéenne 0·096
L'Auto Criterium, 1902	Peugeot ... 0·105	Gladiator 0·0814	Ch. et Walck. 0·0599	Bollée ... 0·0765	Ader ... 0·0661	De Dietrich 0·0709
,, Winners' deciding Trial, 1902	Peugeot ... 0·0889	Darracq ... 0·0646	Ch. et Walck. 0·0514	Delahaye 0·0734	Gillet-Forest 0·1208	De Dietrich 0·0744
Minister of Agricul., 1902 (Alcohol)	—	Delahaye 0 09229	Ch. et Walck. 0·06531	De Dietrich 0·10184	Panhard 0·131785	Bardon ... 0·0996
L'Auto Criterium, 1903	De Dion-Bout. 0·0733	Peugeot ... 0·0536	Ch. et Walck. 0·0542	Bardon .. 0·0592	Gillet-Forest 0·0873	Peugeot ... 0·0489

Mr. John D. Lindsay, an American attorney, is attacking the automobile speed law on constitutional grounds, as he maintains that under the 14th Amendment to the United States Constitution this speed law not giving equal protection to all persons is a contravention of the Constitution. His claim in this respect is that the law is silent in regard to everything except vehicles drawn by horses or motor vehicles, riding horses unattached to vehicles being omitted, as well as bicycle riders or operators of similar vehicles not coming within the motor vehicle class. Decision upon the point has been reserved by the United States Appellate Divisional Court.

The American Automobile Association under its original programme was an association of automobile *clubs* only. It now proposes to extend the scope of its organisation by admitting individuals to membership. By this action it is likely to come into direct conflict with the American Motor League, the organisation which hitherto has lain practically dormant. The Motor League is likely to be the greater sufferer by the conflict, which, as described in an American contemporary, promises to be "something like the meeting of a trolley car with a pea-nut on its tracks—the League in this case being the pea-nut."

THE AUTOMOBILE SHOW AT THE CRYSTAL PALACE.—PART IV.

Most of the well-known American steam cars were shown, and the tendency towards introducing somewhat heavier models with more powerful engines is noticeable. The Locomobile Company had a fine display, including the new 10-h.p. models which we describe this week in another column, and the other new types which they have introduced. One of their smaller standard vehicles was shown in motion as at the Paris Salon, the wheels being supported upon rollers beneath the platform upon which it was staged. The brougham, which forms our frontispiece this week, was also on view.

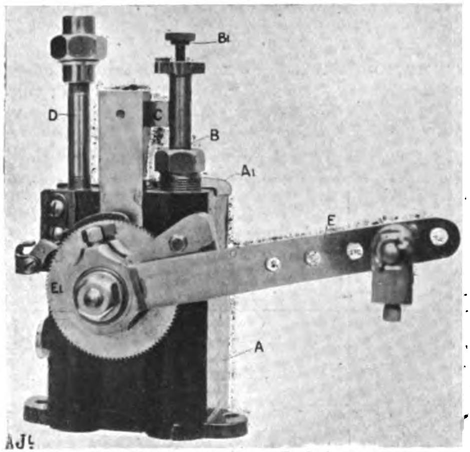


The Johnston Burner fitted to the Weston Car.

The Weston Motor Syndicate's exhibit included stanhopes, touring cars and victorias, besides a special carriage intended for use in India, fitted with a Johnston paraffin burner. The standard Westons embody several improvements, notably amongst which are the employment of a super-heater fitted between the boiler and the throttle valve, and placed between the burner and the boiler, and an automatic lubricator for forcing oil into the cylinders, known as the Rochester Pony, which has been taken up over here by the Vacuum Oil Company. The cars are also provided with steam air pumps, and with an improved by-pass. An ingenious removable back seat, applicable to any of the Weston cars, was also shown fitted; it forms a comparatively comfortable seat for a third passenger, and is further made use of as a spare petrol tank which is concealed in the upholstered arms.

The Johnston burner, which is now made by the Cremorne Manufacturing Company, of Chelsea, is shown sectionally and in plan in our illustration. It has not undergone much alteration since we last described it, although many detailed improvements have been made in it. The paraffin enters through the pipe, A, by which it is conducted into the vaporising ring, B. This ring is pressed out of steel tube instead of being a casting, as formerly. The oil is then led through the vaporising coil, C, to the nozzle, D, where it is controlled by the needle valve, E, which is fixed to the sliding portion of the burner, F and F^1. The air enters through the sleeve, F, in which it is mixed with the vaporised oil, the two passing together into the passages formed in the upper part, F^1, from which it issues through the holes, F^2. The size of the flame is varied by the forked bell-crank, seen in the upper drawing. When turned down low, the flames impinge upon the ring, B, and when turned full on the vaporising coil, C, forms the active part of the vaporiser. The Weston Company have found this burner very satisfactory, and have already supplied vehicles fitted with it for India. The super-heater fitted to these cars is of the Albany pattern. It consists of a bent steel tube fixed in the position already indicated. It is found to effect a very considerable saving, both of water and of fuel consumption, besides rendering the use of a condenser unnecessary under ordinary conditions.

The Rochester Pony Lubricator (see illustration), consists of a metal receptacle, A, having a hinged lid, A^1, and a strainer immediately inside it. It is constructed with a plunger pump arranged in such a manner that the oil is drawn by it from the reservoir, A, and is forced out of the pipe, D, which leads to the steam chest of the engine. The plunger, B, of the pump is shown, and it will be noticed that a projecting piece, C, engages in a slot in it, an adjustment screw, B^1, fits into the end of the plunger and its point comes in contact with the piece, C. The degree of free play between the piston, B, and the piece, C, can thus be varied. The pump is operated by a rod connected at one end to the crosshead of the engine, or to any other reciprocating part, and connected at its other end to the lever, E. Several alternative holes are drilled in the lever, E, to provide an adjustment at this point. The lever, E, is connected with the projecting piece, C, through a ratchet wheel, E^1, and a reciprocating mechanism, so that the piston, B, is gradually moved backwards and forwards in the pump-cylinder, as the lever arm, E, is rocked to and fro. The apparatus is simple and silent, and the feed of oil from it is positively forced into the steam chest. Whenever the engine is running the quantity which it delivers depends upon the speed of the engine after once the adjustments mentioned have been made.



The Rochester Pony Lubricator.

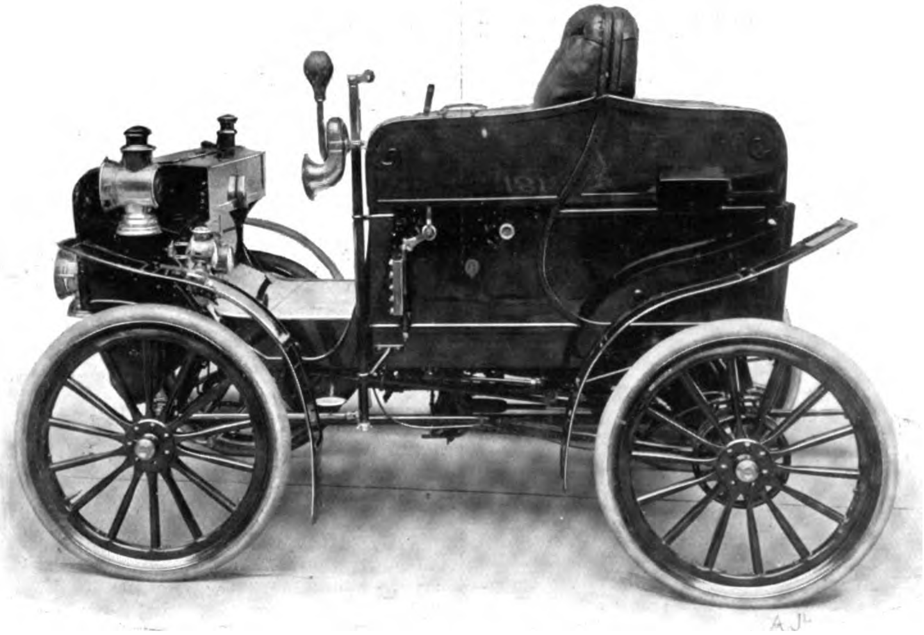
Two of the new White steam cars, which we described in our issue of January 17th, formed a most attractive feature of the White stall. The makers also exhibited one of their better known cars and a delivery van. A 6-h.p. engine with its aluminium crank-chamber completed their interesting exhibit. The new cars attracted a good deal of attention by those who recognised them, although many of the visitors doubtless came to the conclusion that they were petrol cars. The boiler is about 10 per cent. larger than in the older models, but its general arrangement remains the same.

The burnt gases from the boiler are led out at each side of the body, the flues from which it escapes to the atmosphere being fixed outside it. Small hinged flaps are fitted inside these flues in such a manner that the burnt gases are allowed to escape behind when the car is travelling forward, and in front if it were to run backwards, but that the air passing through the flues cannot blow back the gases to the boiler. The engine is automatically lubricated by a belt-driven lubricator on the dash; it contains two pumps, one of which feeds the cylinders and the other the crank-chamber. An ingenious mechanism is fitted to the cylinders and connected with a small foot pedal in front of the driver, by which high pressure steam can be admitted to the low pressure cylinder in order to obtain extra power for starting and in order to avoid any dead-centres at that time. The passage through which the steam finds its way to the low-pressure cylinders has been purposely made small so as to prevent the driver from misusing this foot pedal. For hill-climbing it renders a greater power available so long as the vehicle is travelling slowly, but at high speeds the quantity of steam which can find its way to the cylinder is so small that it ceases to be of much use. The throttle valve is controlled by a small wheel arranged above the steering wheel, and a half turn of it is sufficient to give full steam. The water tank is fitted in front of the dash and has a capacity of 12 galls., a quantity which is said to be sufficient for running about 100 miles, the petrol tank carries 8 gallons. The engine is carried on a light channel underframe, and the eccentric which operates the feed pumps is fixed on the crank-shaft between the cranks. The feed-water pump is placed vertically with its plunger below it, and the pump which returns the condensed water from the condenser in front to the supply tank is arranged below and opposite to it and is worked by the same eccentric. This latter pump is of larger size than before. The air pump for maintaining the pressure on the fuel is mounted in front of the crank-chamber, and its plunger can be brought into engagement with a pin on the cross-head, when required, as in last year's cars. The side brakes are of the internal type, the differential gear is constructed with bevel wheels, the wheels are built of wood, and the double tube tyres fixed to them are 30 inches by 4 inches. The weight of the car in running order is 15 cwt. The hand-pumps are ingeniously arranged so that no separate shut-off valves are needed for preventing leakage past them, the plungers being so arranged as to serve the same purpose. The body is of the tonneau type, and is nicely finished. Spring cushions are provided, and the suspension of the vehicle on its semi-elliptic side springs leaves little to be desired in the way of comfort.

The Victoria Carriage Works showed samples of the Toledo steam cars which we described very fully recently, other steam vehicles of American manufacture being shown by the Autocar Construction Company, a photograph of whose Saracen car we reproduce, and by Joseph Cockshoot and Co., with the latest Stanley models. The Saracen vehicle was fitted with a 16-inch fire tube boiler, and with a 2-cylinder vertical engine of the usual form. A steam air-pump, a steam water-pump, and a water-lifter were fitted; these three mechanisms being controlled from a single three-way cock. The air-pump is provided with a connector-nozzle in order to allow it to be used for inflating the tyres. The rear axle is provided with double-acting brakes close to the hubs of the wheels, as well as on the differential, the former being controlled by Bowden wires. We are told that the burner used can be adapted for burning paraffin. The body provides seats for four passengers, and the back seat is detachable.

In the Stanley steam cars the engine is placed horizontally beneath the boiler, and a spur-wheel, mounted on the centre of the crank-shaft, drives direct on to the differential gear of the live axle. The moving parts of the engine are enclosed in a sheet-metal casing, and its crank-shaft and connecting rods are provided with ball bearings. The burner used resembles that described by us in connection with the Prescott cars. The petrol feed to the burner is unusual, as it is pumped from the main tank and forced into a small pressure reservoir instead of being kept under pressure in bulk. The cut-off of the engine is not intended to be varied by the driver, and the reversing gear is only used for running backwards; it is brought into operation by a foot pedal. The Hydroleum Motor Company showed a Locomobile fitted with their paraffin burner, from which we understand that recent tests have been obtained showing the same fuel consumption under similar circumstances when using crude oil costing only *2d.* a gallon as when using ordinary petrol. The Company's exhibit was of a more ambitious nature than formerly, and the system employed remains much the same as when previously described by us. Our readers will remember that the liquid fuel is pulverised by issuing through a jet which is surrounded by a concentric jet of steam. The mixture is led into a passage lined with fire-clay and asbestos, in which a pilot light is kept burning and the flame is formed, air being drawn in through an opening surrounding the fuel feed-pipe. This chamber opens into a larger one, which is lined with fire-resisting material, and resembles a big frying-pan.

All the best known tyre manufacturers were well represented, and in this respect also the Exhibition was more complete than any previous show in this country. Few tyres which are altogether new to our readers were on view, but the general all-round improvement in their manufacture was particularly noticeable. However, the chief feature of interest, in connection with tyres, resulted from the attention which has been given of late to anti-skidding devices of all kinds, a large number of which were to be seen, some involving modifications of the tyre itself, and others being separate attachments.



The Saracen Steam Car.

The Dunlop Company's stall was rendered particularly interesting owing to their having been awarded the first prize in the tyre trials organised by the Automobile Club, and they showed a variety both of their Gordon-Bennett motor tyres and of cycle tyres of all kinds, besides general rubber goods for automobile purposes. The novelty on the stall was their non-skidding cover in which the tread is thickened up and is provided with semi-circular cross-grooves, which have been found to be wonderfully effective in securing immunity from skidding. The grooves are made at intervals around the periphery, and the tread is the same thickness through at the bottom of the grooves that it is in the ordinary covers.

The Collier Twin Tyre Company, who were awarded the second prize in the recent Tyre Trials, made an excellent exhibit, and had secured a prominent position in the building. The Parsons Non-Skid which we described in our issue of Jan. 10th last, figured prominently on their stall, they had a very complete collection of all sizes of their well-known tyres, inner tubes and rims, some being fitted to artillery wheels, and others to wheels of the cycle type. They also showed three out of the four inner tubes which ran throughout the 4,000 miles run on the Trials, and demonstrated the ease with which the Collier tyre can be detached from the rim.

The Clipper Pneumatic Tyre Company not only had a large assortment of their Clipper Continental and Clipper motor tyres, but also brought a new non-skidding cover to the notice of the public. The construction of it differs entirely from any of the other devices having a similar object, for the tyre is fitted with a flat tread, in the centre of which are embedded corrugated metal discs, 1 in. in diameter and about 1½ in. apart, lying flush with the tread itself. The discs are fixed in place by being screwed into sockets which are built into the fabric and are vulcanised in place with the cover. The discs can be replaced when the corrugations are worn down, and the company claim that side-slipping is practically impossible with this arrangement.

Other anti-skidding devices to be seen were the Williams counter-skid and the Bailly tyre, which we have already referred to in connection with the Clarkson's, Limited, exhibit. The Williams device was described in the Journal on August 9th last, and has since that time been provided with means for adjusting it to suit any vehicle to which it may have to be attached.

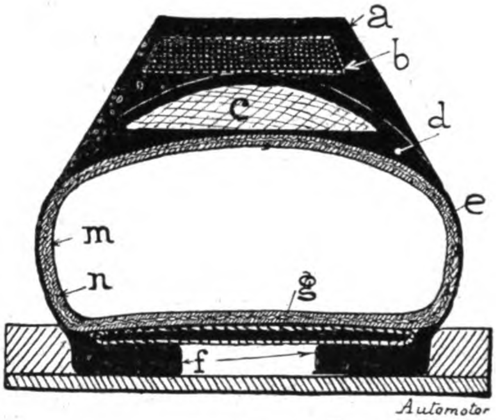
The North British Rubber Company's exhibit was very similar to that made by them at Earl's Court, a great variety of Clincher-Michelin and Clincher tyres being in evidence, and the capabilities of the Michelin tyre-guard being again demonstrated by the same apparatus.

The Sirdar Rubber Company's stall contained a variety of motor car wheels made by them, both of the cycle and of the artillery type, some being fitted with runs for pneumatic tyres, and others with the Company's well-known "Buffer" solid tyres. The latter are made in all sizes, for vehicles up to 6 tons in weight, and large sections were shown of those employed for fast and heavy cars, which run at speeds of up to nearly 40 miles an hour, the Company claiming to have overcome all objections to using such tyres for high speeds. They also brought before the notice of the public special pneumatic tyre covers for motors and for bicycles which are made endless, and which compress automatically both laterally and longitudinally without its being necessary to employ any foreign substance; they are not, however, able to supply these until next year. The advantages claimed for them are that the compressed state of the rubber renders it less liable to be cut, and that if cut it tends to close up instead of to gape. It will be remembered that the Sirdar type is made endless with compensating twists, and that by this ingenious construction its outer surface is put into compression laterally and longitudinally when in place on the rim. One of our illustrations shows a Milnes Daimler omnibus, which was on view on that Company's stall, which is fitted with 3-inch twin high-speed Buffer tyres. The vehicle weighs 5¼ tons when loaded, and carries thirty-six passengers. These tyres have, we understand, run for 2,000 miles, and apparently are capable of repeating the performance.

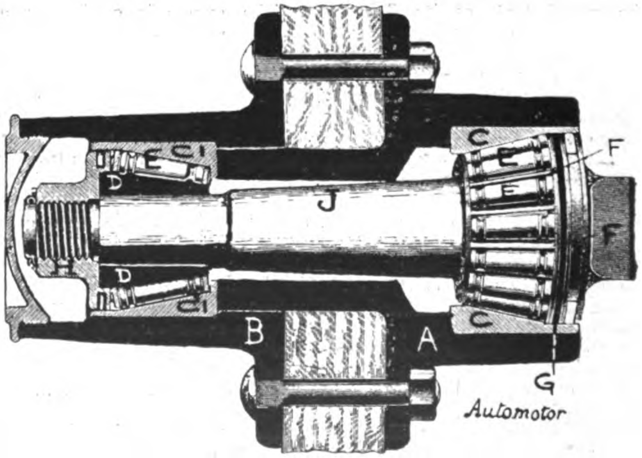
The Goodyear Tyre Company made a thoroughly representative show of their well-known productions, with which the majority of our readers are already familiar, and the Shrewsbury and Challiner Tyre Company had a large selection of wheels and tyres on their stall. The Self-Acting Air Chamber Company were also well in evidence with their patent self-sealing air tubes, rubber treads, and English-made single tube tyres.

The Martin Pneumatic Tyre Company's new sections demonstrated that the Company have now succeeded in producing well-made tyres, and that the unfortunate faulty construction which prevented them from showing the merits of their tyres in the trials last year is now a thing of the past. In addition to a selection of tyres and a display of sections, the Company staged a 12-h.p. M.M.C. vehicle fitted with Martin tyres.

The Rucker pneumatic tyres and inner tubes, which we referred to in connection with the Earl's Court Exhibition, and which are constructed on new principles which we then briefly referred to, were again brought prominently before the public. The stall was fitted with an ingenious machine which was intended to show the relative efficiency of various tyres, and the relative draw-bar pulls which are required with each. Unfortunately, however, it was found impossible to complete the machine and to show it in operation, but it attracted no little attention and interest from the visitors. Pressure on our space prevents us from entering very fully here into the principles involved in the construction of the Rucker Tyre, but the accompanying section will give a general idea of one form of construction employed. The exterior rubber tread, a, contains a band made of several layers of thread wound circumferentially; the layers forming this band are prevented from spreading sideways by a single layer of canvas, b, which surrounds them. The band renders the tread inextensible longitudinally, and capable of standing great strain without effect on its resiliency, besides compressing the tyre circumferentially. The cover contains an inner band, c, built up of alternate plano-convex blocks of wood of the section shown, and of rubber which makes it transversely inflexible, but longitudinally flexible and compressible. This is embedded in soft rubber, d, which distributes the transverse flexion over the sides of the tyre. The walls of the cover, e, are made of a fabric having isolated transverse threads only, which is supported on both sides by canvas in which the threads run diagonally; the walls are therefore very thin, and merely serve to connect the crown of the cover and the tread with the rim of the wheel. The inner tube, m, with its embedded threads, n, which render it unburstable, is compelled to take the shape shown owing to the construction of the cover, and a special feature is made of the fact that the cross-section of the air chamber is considerably wider than the tread, lower air pressures being in consequence required. Rectangular beads, f, which are secured to the edges of the cover enable the tyre to be fixed in place. The beads are hard but have a slight longitudinal elasticity. They are held down in place by a wide metal band, g, which is caused to tighten on them, its ends sliding over one another.



Section of the Rucker Tyre.



The Timken Adjustable Roller Bearing.

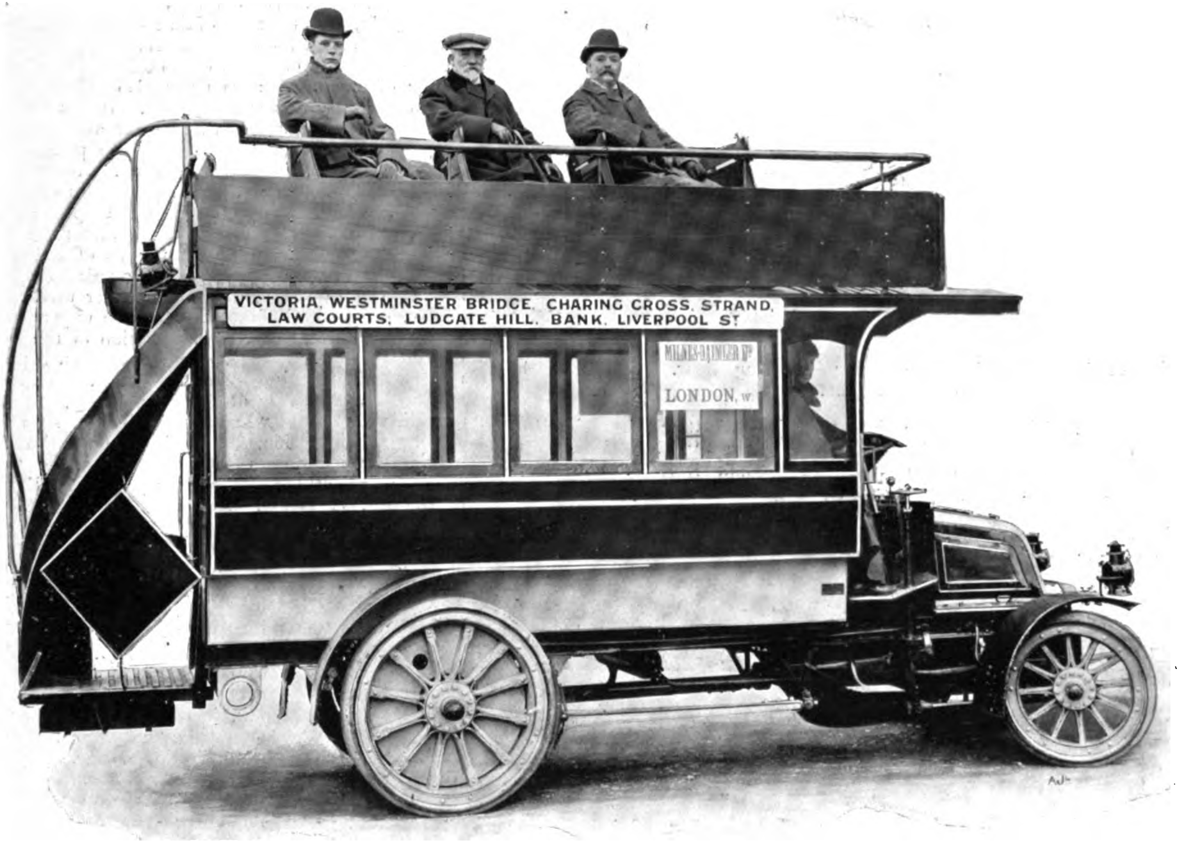
A new American tyre was to be seen on the Locomobile stall, this being the Fisk, which is a double tube tyre; and of which we show a section this week in connection with our article describing the latest Locomobile models.

A large number of petrol motors constructed for the use of automobile builders were to be seen, the Simms Manufacturing Company having a large stall, and showing various sizes both of these and of magnetos and other parts of their ignition system. Mr. Selbach not only exhibited Mutel motors, of which he has taken up the agency, but had a very fine assortment of other parts for the manufacture of automobiles, including frames, gearing, axles, and springs made by the best-known Continental concerns. Regal and Elswick cars were also staged on his stand. Aster motors in great variety were shown by the Begbie Manufacturing Company alongside their special radiators and other automobile accessories.

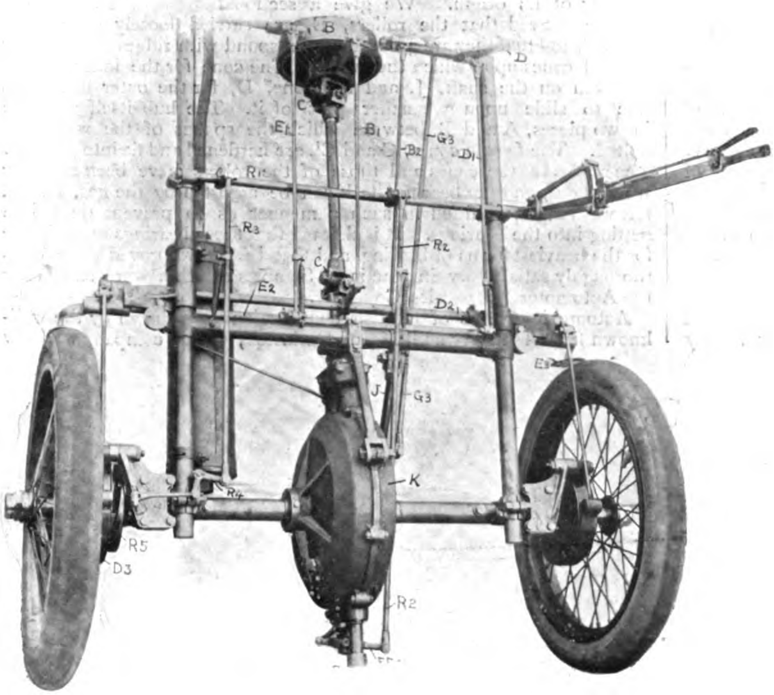
Well finished motors known as the Victrix were prominent features of the Farman Frères' exhibit, and Captain H. H. P. Deasy showed separate motors, as well as the Rochet-Schneider vehicles previously referred to. Other motors shown were the Lux, the Fafnir, and a heavy-oil engine intended for the propulsion of goods lurries, manufactured by the well-known makers of the Gardner gas and oil engine.

The accessory exhibits were even more numerous and varied than at previous Shows, and most of the well-known makers and agents were well in evidence. It is impossible to attempt a description of the many new conveniences which are constantly being brought out in this direction, but it is well worth while for motorists to pay occasional visits to those who have taken up the supply of these articles, and to take advantage of an Exhibition of this kind for the purpose of inspecting the novelties. The variety of conveniences which are now available is great, and many of them would prove invaluable to those who indulge in the sport. Accessories of interest, more particularly to automobile builders, were also so numerous that the considerations of space prevent us from discussing them, and it is only in a very few cases that we can make any reference to such parts. The Timken adjustable roller bearing may, however, be briefly mentioned, as it is an American invention which has been adopted for a variety of purposes in the country of its origin. We give a sectional view of it, where it will be noticed that the rollers, E, are carried loosely in a light cage, F, and that they are grooved to correspond with ridges on the inner tapered cones upon which they work. The cone for the inner bearing is driven on the shaft, J, and the cone, D, for the outer bearing is free to slide upon a smaller part of it. The hub itself is made in two pieces, A and B, between which the spokes of the wheel are bolted. The female cones, C and C^1, are hardened and fit into the hub. The angles of the cones and those of the rollers have been carefully worked out, and the bearing itself can be adjusted by the nut, H. A felt washer, G, is fitted in such a manner as to prevent dust from getting into the bearings. It is claimed that these bearings are suitable for the heaviest forms of bearing, and that they have proved themselves thoroughly satisfactory in practice. Samples of them were shown by the Automotor Accessories Company.

Automobile frames of English construction were shown by the well-known firm of Rubery and Co., of Darlaston, which company are now laying down the necessary hydraulic plant for the construction of pressed steel frames. The Weldless Steel Tube Company had an assortment of samples of their special tubing, and also exhibited some special cylinders made in nickel steel. Aluminium castings in great profusion, many of them involving complicated core work, were shown by several concerns who have given special attention to this work for automobile parts, amongst these being the Birmingham Aluminium Castings Company and Walter Mills and Co., of Sunderland. Wheels for cars were not only to be seen in great variety on the stalls of those who have taken up this special work, and who are already well known in connection with it, but some very well-built samples were displayed by Savage Brothers, of King's Lynn. Samples of lubricants in great variety were by no means absent, and all the companies who have made a special study of the subject for motor car use, seized the opportunity of bringing their products before the notice of the public. The Vacuum Oil Company also displayed some special forms of lubricators manufactured by them, and well worth the atten-


VICTORIA. WESTMINSTER BRIDGE. CHARING CROSS. STRAND.
LAW COURTS. LUDGATE HILL. BANK. LIVERPOOL ST
MILNES-DAIMLER Ltd
LONDON, W

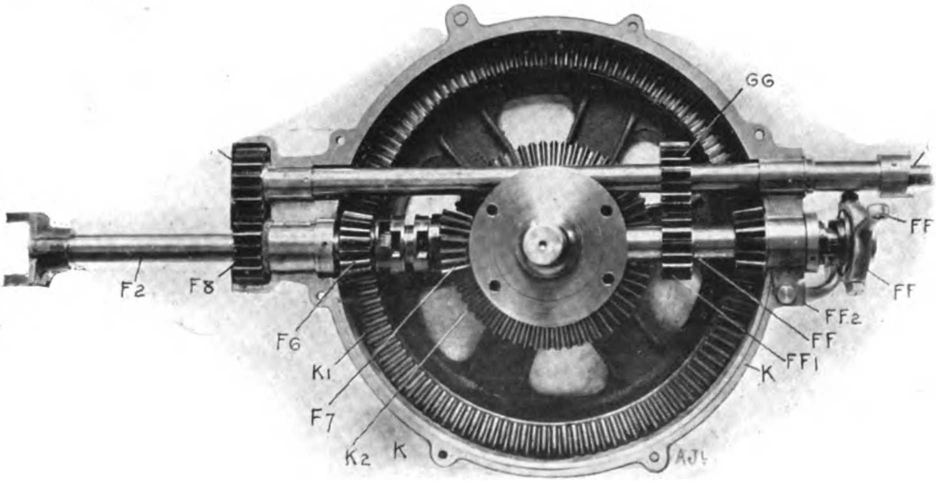
The Milnes-Daimler Petrol Omnibus, fitted with Sirdar Buffer Tyres.



Rear Portion of the Swift Chassis, showing Reversing Gear. Shown at the Crystal Palace.

R.—Reversing lever. R^1.—Transverse shaft to which R is attached. R^2.—Rod passing from arm on R^1 to forked lever, FF^4 (which brings "reverse" bevel into play). R^3.—Rod passing from arm on R^1 to bell-crank lever, R^4. R^5.—Jaw-clutch controlled by R^4 locking the ratchet gear in hub.

The other letters correspond with those used in our illustrated description of the Swift voiturette (Vol. VII, pp. 645–648).



The Swift Change-Speed and Reverse Gear. Shown at the Crystal Palace.

GG.—Spur wheel on starting shaft, G. FF.—Shaft carrying spur wheel, FF^1. FF^2.—"Reverse" bevel wheel meshing with wheel, K^1. FF^3.—Jaw-clutch for securing wheel, FF^2, to shaft, FF. FF^4.—Forked lever operating clutch, FF^3.

For description of other lettered parts, see illustrated article, October 18th last, pp. 645–648.

tion of manufacturers. Amongst others should be mentioned Messrs. Stern Brothers, Joseph Lucas, Limited, Price's Patent Candle Company, and W. H. Willcox and Co.

In the way of tailoring, Mr. A. Dunhill had a very fine and extensive exhibit of all kinds of fur and leather clothing specially designed for automobile use. In addition, he displayed a number of the usual accessories such as horns, dashboard clocks, and special forms of hats for ladies. A particularly handy type of speed indicator was also exhibited in the form of a clock with another dial indicating the speed attained round the edge of the clock dial. This was adapted for mounting on the steering wheel, being provided with an ingenious method of fixture for the purpose. The speed indicator itself is driven through a flexible connection by a friction wheel mounted on the chassis. One of Mr. Dunhill's specialities is the umbrella coat which goes over the head of the wearer and fastens by means of a solid rubber collar tight round his throat. Very attractive novelties were displayed in the form of dust shields for ladies' use, resembling a large fan or fire-screen, with a sheet of mica let in near the top through which a full view of the road can be obtained. A mica mask also exhibited at this stall was a very attractive novelty. It was adapted to be attached to the cap of the wearer and covered the greater portion of the face. When in position it was practically quite invisible. Messrs. Hoare and Co. also catered for the wearing requirements of the automobilist. They have brought out a special form of livery, which looks very serviceable, and must be very satisfactory to the wearer. It consists of a short upper coat like that ordinarily worn by the regulation chauffeur, and a kind of rug which can be either used independently, or attached by a belt to the upper coat, the whole then forming a perfect imitation of the ordinary coachman's coat. Some of these have been supplied to the Lord-Lieutenant of Ireland. Messrs. Lovegrove and Co. made a speciality of fine leather caps, and of what they describe as the "Drymosit" rug. It seems to be an excellent invention. When it is in use the automobilist using it appears to be clad in shaggy trousers, but it is a rug all the same. It is provided with pockets for the feet. It is laid down on the seat and the driver sits down on it, thrusts his feet into the pockets, and then buttons the two sides of the rug round his legs. As it is waterproof the formation of the not infrequent puddles in the seat in rainy weather will not inconvenience him in the slightest, and the construction of the rug makes its warmth a certainty. Mr. C. R. Base also exhibited a number of fur articles and various forms of clothing, including a very smart pony-skin ladies' coat and skirt of a very attractive appearance. A particular of Mr. Base's exhibit also consists of ladies' hats and veils for motoring, in which a considerable amount of fresh designing work has been done, the result in most cases being a happy blend of the smart and useful. Mr. Base also exhibits a double legged rug of somewhat the same general appearance as the "Drymosit" rug, and a very funny exhibit consisting of a lady gorilla got up in modern costume for motoring which appears to suit her splendidly, the goggles particularly harmonising with her general cast of countenance.

Brief mention should be made of the specially-prepared cloths for cleaning purposes which have been introduced by "Garlio," of Erith, Kent. They have the advantages of absorbing oil and grease very readily, and are just the kind of thing which is required by automobilists.

MOTOR BICYCLES.

Digest of a Paper read by Mr. M. O'Gorman on March 20th before the Automobile Club.

Mr. O'Gorman, in opening his Paper, pointed out the riddle he had been set by the request to treat a technical subject like motor bicycles non-technically, but he would do his best. The Paper, although instructive, was amusing throughout. He commenced with an entertaining experience with a Frenchman, of whom he asked several leading questions as to whether the engine throbbing did not tire his hands? whether the gyroscopic action did not interfere with his steering? had he ever fallen? had the machine ever given trouble? and to each of which he received the invariable reply "Non, Monsieur," his final question as to whether Monsieur understood English receiving the same reply! Continuing his personal experience, he said that the "trouble stage" had to be overcome, and this either made or marred the machine. If, during this course, every fault was remedied, after 500 miles the original value of the machine was almost doubled. The advantages of the motor bicycle, firstly, were simplicity of steering, gear, frame, engine, engine-starting device, cooling, governor (viz., none), repairs (owing to the accessibility of everything) and tyres. Secondly, it had the advantage of not running backwards downhill, you could dodge carts easily, you were safe from the police at higher speeds than a car, from being stranded on the high road, as you could pedal, in being able to find enough petrol to get through with, in horses and policemen not being frightened by your appearance, in brake-power as compared to your inertia, and in being safer than a car from skidding. Thirdly, the advantage was to the motor bicycle in hill climbing and speed, as you might make a better average speed than a car up to five times its price. He considered in London, after a year's experience, it could beat train, car, tram, or cab. In traffic blockages you could worm your way to the front of the stoppage and get away first on the open street, free from carriages, where the speed of the machine could assert itself. Its cheapness was unrivalled in petrol and oil (a run to Oxford cost 4½*d.*), in tyre upkeep, to house, to clean, to take by train, to repair, to insure, and it required no chauffeur. In minor matters, for a given speed, it raised less dust than any other "car," and at its destination it could stand in the garden or near a shop door. Repairs did not compel its driver to take up such a position under his mount that he got hot water in one eye, lubricant in the other, petrol in his mouth, mud in his ears or hair, with the extra chance that a spanner would fall on his face owing to a friend unwittingly pushing the road wheels over his leg while stumbling over his middle part. This "younger brother" of the motor car deserved earnest encouragement from all motorists as it increased (1) depôts for petrol and oil, (2) the number of people who understood the explosion engine, (3) the number of fast travellers on the road which gave weight of numbers to the whole automobile movement and removed from the sport the absurd criticism of "rich men's Juggernauts," (4) the chance of road improvement and for the study of tyres and new designs on a cheap scale, (5) it was a direct feeder to the membership of the Automobile Club, the Roads Improvement Association, and the C.T.C.

The chief points which some people claimed against the motor bicycle as disadvantages mentioned by Mr. O'Gorman were that the rider was exposed to cold and mud, that it was a lonely and unsociable pastime, riding was not as in an arm-chair, that the motor bicyclist was bullied by owners of larger vehicles, that he must make violent bodily efforts to start his machine, that his weight of baggage was very restricted and his position fatiguing, that breakdowns were more frequent than on good cars, that there was no protection from road shocks by springs, and finally that the exposed position of the rider's calves made him particularly attractive to large dogs.

In regard to getting hot and then catching cold this was not true, and if warmth was required it was easy at any time to cut off some of the mixture and pedal. The objection of mud was more real, and Mr. O'Gorman accentuated a point much overlooked in most road vehicle designs, viz., the extreme importance of surface smoothness and the absence of unnecessary roughness, projections, straps, mouldings, levers, ornaments, &c. He suggested comparison of the simple lines of some American designs with the "ungainly aldermanic fullness of the bulbous profile which is imparted at great expense to the back of some much-prized tonneau bodies." Something similar applied also to motor bicycles, owing mainly to almost every detail being an accessory, which seemed to be added as an afterthought, so that numberless dust-catching straps, buckles, bolts, exposed electric wires, and petrol pipes, &c., pervaded every part of the frame, rendering the machine consequently uncleanable. In regard to jolting and bumping he maintained he was not jolted and bumped, and if he was he liked it. In fact 35 miles per hour up hill and down dale over the Roman road to Gloucester was, he thought, the nearest approach to the thrill of hunting that he knew of. Neither was motor cycling a solitary game. It would be found in summer weather that free wheeling was an exercise which your girl friends greatly enjoy. Waltzing, he said, was a very legitimate pastime, during which your hand is gently pressed against the waist of your partner. He had heard waltzing was found to be agreeable. Imitate the position after you have mounted your motor bicycle when *she* is on her "free wheel." Begin at 10 miles per hour, just to help; she will soon stop pedalling, and you can increase to 15. You could get to Henley quite nicely that way.

In regard to exercise, the man whose objection to motor bicycles was because he liked to get exercise, need not worry. He could get all he wanted on a motor cycle. Mr. O'Gorman's experience in skidding, he confessed, did not render him competent to indicate the best way to do it. Continuing on this subject, he said it was generally known that an exhaust valve lifter was indispensable in this connection; but a very delicate carburettor which did not fail to give mild explosions when the throttle was nearly closed, and which in conjunction with mechanical valves would keep the engine running "dead slow," was a useful safeguard against skidding. The next safeguard was a flexible drive. Advantage in this direction would be derived from flywheels being much larger without being heavier. The jerks would be diminished, and as it was the beginning of a slip that must be avoided, every trifle counts. Also, if these larger flywheels were to rotate in the opposite direction to the road wheels (like the Enfield)), then gyrostatic action would assist the rider in keeping vertical instead of acting in the opposite sense, as they did now.

The gyroscopic action would not even then diminish the amount of side pressure on the ground, but it would diminish the amount of slope of the bicycle.

Restriction of the kit and the "week-end" clothes question could easily be solved by a little careful study. He had a luggage carrier, which also served as a stand, the latter being indispensable to enable miss-fires on the road to be properly diagnosed.

Mr. O'Gorman was particularly emphatic on the common error in the design of the ignition advance. Fashion, he said, led to imitation in the construction and design of motor cycles to the detriment of its simplicity and general usefulness. Three needs, he said, were retarding the progress of motor cycle design. First, there was not enough work done in the engineer's *drawing office*; secondly, the influence of fashion was far too strong, and was only inadequately counterbalanced by cranks and "mania"; thirdly, ready-made accessories, which must be fitted in, hamper and distort the unity of design.

Dealing with "mania," he said one man had a weight mania and saved on his silencer and front forks. One saved space by placing the engine in the road wheel. One had a narrow tread mania and sacrificed bearings. One had a chain drive mania. One had a free engine mania, and made his engine difficult to ride in traffic. Some thought that one man can only work one lever, &c. The little fads were admirable for us all, because the faddists give an intensity of study to some excellent detail which results in its perfection. But it was time that an unbiassed engineer should mass and collate information and give us first the drawing and then the fact of a well-plated 100 lb. machine with a moderately narrow tread, full width bottom bracket, strong front forks and pedal cranks, a flexible chain-drive, two speeds, a cool 3-h.p. engine—with a third bearing on it—that could take its restart from the road wheels and be free at will, mechanical valves, replaceable parts, sound and well protected ignition gear, spring seat and handles if not a spring frame, good brakes, a carrier incorporated in the design, and also gear cases, &c., &c. Let even the accessories be so re-designed that they fell in perfectly with the general scheme. The initial difficulty of such combination was to properly place the engine. Reference to some of the past designs in this respect was made to Mr. Worby Beaumont's "Motor Vehicles and Motors," and to The Automotor Journal of 1900.

Coming to competitions, he thought that rules should be made so that the competition would be fair, sporting, and useful. To be fair, there should be artificial barriers securing similarity between the competitors; to be useful, (1), the artificial barriers should be few and should rule out some objectionable feature such as excessive weight rather than limiting cylinder capacity. (2) The design should include luggage carriers, brakes, spring handles, seats, and good silencers. A preliminary hill test should eliminate machines not conforming to some standard of climbing speed, and noiselessness, say a machine at 10 m.p.h. should be inaudible at 100 yards to a blindfolded man on a still day on Dashwood Hill. (3) Pedalling should be allowed except on timed hills, and roadside repairs should also be allowed as they implied accessibility.

To be sporting, mechanical monsters should be relegated to a special class. These should not be discouraged, as they were important experiments—expensive and educational. There should be classes up to 100 lbs., 150 lbs., and over 150 lbs. He should like to see an elimination trial held on the following suggested lines:—

(1) The competitors' number should be reduced to about 25 by having one only of each make, or by selection of the Judges, or by the hill climb and the silencer test. They should then run 1,000 miles in eight days, keeping always between a pair of cars to control the maximum and the minimum speed, the minimum to average 11 miles per hour.

(2) Repairs, alterations, &c., might be made *en route* by the driver only, provided he was not passed by the minimum car; he might therefore pedal, dismount, or push without loss of marks save on the two test hills, which might be Westerham and River Hills.

(3) Refill of petrol or oil allowed only every 100 miles and measured, the inlet hole being sealed.

(4) Special timing of two hills with special marks for accuracy of declared horse power, for light weight in relation to power, and hill speed, pedalling not allowed.

(5) A maximum weight to be fixed when loaded, all riders' weights to be equalised, and all to have a luggage carrier to facilitate this.

The weight limit should be introduced, as it tended to get the highest weight efficiency for the motor bicycle. Light weight meant that the machine could be carried over the kerb, &c., that if the machine fell it was less damaged, and skid became less serious. It required less tyre attention and less power up hill. It had less inertia, and was therefore more easily stopped by the brake.

The limiting of cylinder capacity tended to encourage increased motor speeds for a given power, as did limiting the weight, both, however, tending to disregard fuel economy. Limiting the weight tended to getting the most work out of a given weight, limiting the capacity to getting the best work from a given volume of cylinder. Limiting capacity failed to encourage the development of a light vehicle.

He thought that if a very straight track were found it might yet fall to the lot of a motor bicycle to win the Gordon-Bennett race.

The great range of country to which the motor bicycle gave access rendered photography one of the great fascinations of the sport.

During the evening a number of interesting views were shown, and Mr. O'Gorman, towards the conclusion of his paper, possibly to balance his little opening story, related the following humorous experience:—

"I was trying to think out how it was that the natural process of elimination had not produced a breed of chickens that did *not* cross the road under one's wheels, when I felt a thud like kicking a football, and saw that the middle of my front wheel had bumped a hen, which went away squeaking hysterically; I thought I had broken its wing. The old woman who owned the bird caught it. I got off and found nothing wrong, so I gave her sixpence, in return for which bounty she told me her secret. 'When I wants a pullet killed I sends them into the road, and it's like as not it's killed and paid for, and I has my pullet into the bargain.'"

* * *

A 100-MILE road race, 50 miles out and back, is being planned by the Long Island Automobile Club (U.S.A.) for the spring.

THE Coupe D'Arenberg for vehicles using alcohol as fuel will this year be run for in connection with the Paris-Bordeaux automobile race.

A "COUNT POTTING CUP" is to be offered by the Austrian Automobile Club during the coming season. Competitors will be confined to members of the Austrian Club of not less than six months' standing, and the competing cars must be owned and driven by members of the Club. The race, if possible, will be held in Austria.

Motor Tricycle Track Record.—The official notification sent us, of the distance of 38 miles 1,141 yards, covered by the Eagle racing tandem, on the 9th inst., on the Crystal Palace track in the hour, does not appear to be as accurate as these official communications usually are. Mr. Charles Jarrott has drawn our attention to this performance, and points out that considerably better records have been made by himself, viz., in the race in 1900 for the Crystal Palace Brassard, when he and Machin covered over 39 miles in the hour, and in October, 1901, at Canning Town track, Mr. Jarrott covered, on a tricycle, 42 miles 235 yards in the hour, this distance still standing as British motor tricycle record.

THE GORDON-BENNETT RACE.

SUBJOINED is the text of the Bill introduced by the Hon. John Scott-Montagu to authorise the holding of the Gordon-Bennett motor car race in Ireland this year:

Light Locomotives (Ireland) Bill.

Be it enacted, &c.,

1.—(1) The council of any administrative county may, on the application of any persons or club, by order declare that any roads within the county may be used for races with light locomotives during the whole or part of any days specified in the order, not exceeding three days in the year.

(2) The order may contain such provisions as the county council may think fit for the temporary suspension and regulation of other traffic for the safety of the public, for the restriction of speed in populous places, and for other purposes incident to the proper conduct of such races.

(3) Public notice shall be given of the provisions of the order by placards on the roads so authorised to be used.

(4) No provisions of any Act, bye-law, or regulation, restricting the speed of locomotives or imposing any penalty for furious driving shall apply to any light locomotive, or the driver thereof, engaged in such races save so far as the same may be incorporated with the order.

2. The expenses incurred by a county council in carrying any order under this Act into effect shall be defrayed by the applicants, and the county council may before granting the order require the applicants to make such deposit as may in their opinion be necessary to defray such expenses.

3. In this Act the expression "light locomotives" shall have the same meaning as in the Locomotives on Highways Act, 1896, and all other expressions shall have the same meaning as in the Local Government (Ireland) Act, 1898.

4.—(1) This Act shall extend to Ireland only, and may be cited as the Light Locomotives (Ireland) Act, 1903.

(2) This Act shall only remain in force until the thirty-first day of December, one thousand nine hundred and three.

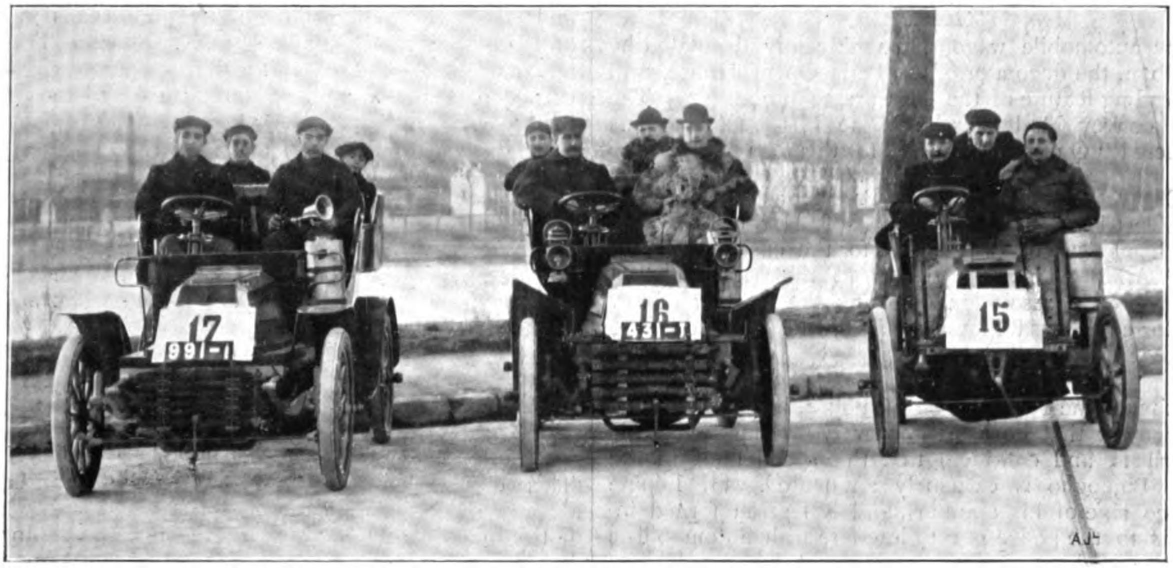
* * *

THE rules governing the Tourist Competition of the A.C. de Touraine, which we published on February 14th (page 185), have since been modified in the apportionment of points. Instead of 1 point per 100 francs by the catalogue price, it will be 1 point per 1,000 francs; and instead of 5 points per kilom. for an average speed over 40 kiloms. per hour, it will be 10 points per kilom. average speed over 30 kiloms. per hour throughout the run.

THE Mont-Ventoux Hill Climb, organised last year by *L'Auto* in conjunction with the A.C. d'Avignon, is to be repeated this year. The length of this hill is 22 kiloms., and last year was covered by Chauchard in 27 mins. July 6th is tentatively proposed as the date, which will be two days after the Aix-les-Bains week. As this date, however, may clash with the Gordon-Bennett Race, it is possible that the meeting may take place before the Aix week. An innovation is to be made in the form of a water consumption trial in order to determine the most effective form of cooler.

THE interdiction of the chief racing event of the Nice Week may cause *L'Auto* to abandon their automobile "Caravan" from Paris to Nice. Unless they receive fifty entries they do not propose to proceed with the organisation. Should the excursion take place, a start will be made on March 23rd, arriving at Nice on the 28th. A Hill Climb will be part of the programme, and the vehicles will be divided into two categories, viz., (*a*) Vehicles for which the time of departure and arrival is taken for each stage; (*b*), Vehicles which simply leave and arrive at each stage at their leisure so long as they arrive before a stated hour. The daily run will be about 200 to 220 kiloms., and for fast cars extra detours will be arranged.

IN Paris the Gordon-Bennett race is, as a popular event, becoming quite overshadowed by the Paris-Madrid race, which promises to bring out the biggest field of any automobile event ever held. In Spain the enthusiasm is equally keen, and the King of Spain is personally taking considerable interest in the race. He has issued a Royal Ordnance recommending the municipal authorities between Irun and Madrid to place the whole of the roads to be traversed by the cars in good order, and it is stated that he will personally welcome the first arrivals to his capital. The first all-English car and English driver to start will be Mr. H. R. Kirk, of Headingley, Leeds, one of the most enthusiastic and proficient automobilists in the United Kingdom. Last week, owing to the curious habit the French have of eliminating initials, we overlooked the fact that Mr. Kirk had drawn a number so high up as 17, and we cordially wish him every luck on the run. Mr. Kirk will drive one of the new racing Napiers, and this should serve as an excellent experience for the defending car in the subsequent Gordon-Bennett race. Lieut. Mansfield Cumming, R.N., who drew No. 22, will drive a 50-h.p. Wolseley, the chassis of which was at the Crystal Palace Show, and was illustrated by us on February 7th, p. 142. Good luck falls to Mr. Charles Jarrott, as he will be the first starter in the race, driving No. 1 De Dietrich car. Our pleasure at seeing Mr. Jarrott win would be only tempered by one regret, viz., that he was not driving an English-built vehicle. Messrs. Loraine Barrow and Stead will also drive De Dietrich cars, and Count Zborowski a Mercedes.



PARIS CONSUMPTION TRIALS.—The three 10-h.p. Chenard and Walcker Cars, Nos. 15, 16 and 17 (see page 224).

THE regulations in the Tourist Section notify that entries will be received until April 30th, at 200 francs per vehicle. Starting on May 14th, as already announced by us, it will be almost a "go-as-you-please" throughout, except between St. Sebastian and Madrid, all Controls between these points being compulsory. Cars must be driven, piloted, or accompanied by a member of the A.C. de France or other recognised Clubs. Time sheets will be issued on which the time and dates of the starting from and arrival at each stage will have to be recorded at the respective Controls. Medals will be issued to those vehicles covering the entire course.

MR. HERBERT A. JONES last week read a paper on "Electric Ignition" at the Bradford Conservative Club. The reading was followed by an interesting discussion.

"ROAD TRAFFIC IN AND NEAR LARGE CITIES" is the title of a paper which will be read by Mr. W. Worby Beaumont before the Society of Engineers on March 2nd. A discussion will follow.

THE address of Mr. F. C. Blake, whose commutator we illustrated and described last week, is Station Avenue, Kew Gardens—not Hammersmith, as mentioned by us. We may mention that Mr. Blake has provisionally protected his device.

PEERLESS and Rambler cars will be from now on view at 7 and 9, Carteret Street, Broadway, Westminster, where the Petrol Motor Power Company, the British agents for these cars, have acquired new premises. Garage accommodation for twenty cars is also available, in addition to the space required for the Company's stock.

THE "City Garage" has been opened at 49, John Bright Street, Birmingham, about one minute from New Street Station, by G. F. Heath and Company. Excellent accommodation for motorists is provided, and besides a stock of petrol, accessories, &c., being kept, an inspection pit is available for use, and every class of repair can be promptly effected on the premises.

WE learn that several new types of motor vehicles are likely to be on show for the first time at Mr. Cordingley's Agricultural Hall Exhibition next month. In addition to the features previously mentioned by us, it has been arranged to reserve Wednesday, March 25th, as a Club

Day, when the admission will be 2*s.* 6*d.* On other days, as before, the entrance charge will be 1*s.*

A Rome Automobile Club has been founded, with Prince Don Alfonso Doria as President.

Prince de Wagram, Count Jean de Castellane, and Count Gerard de Garay are amongst the latest who have acquired Charron, Girardot, and Voigt cars.

Automobile Topics Daily was published during the Chicago Automobile Show on similar lines to the daily issue which appeared in connection with the New York Exhibition.

Owing to the prospect of the cars having to plough their way through a sea of red New Jersey mud, the A.C. of America at the last moment abandoned their run to Lakewood on Washington's birthday, Philadelphia being substituted as the destination.

Three automobile wagons, magnificently decorated by M. Jambon, the decorator of the Paris Opera House, will be the leading feature of the Mi-Careme procession. The first will convey Mademoiselle Marie Missioux, who has been elected "Queen of Queens" for this festival.

Mr. Milton J. Budlong, Vice-President and Treasurer of the Electric Vehicle Company, of Hartford, Conn., U.S.A., has been elected president for the ensuing year of the N.A.A.M. This Association, at their meeting last month, passed a resolution opposing the holding of any contest for commercial motor vehicles, as suggested by the A.C. of America.

M. Lépine, the Paris Prefect of Police, has made public announcement that he is inclined very favourably towards automobilists, and considers that the speed limit in the Bois de Boulogne is extremely antiquated. M. Lépine has the courage of his opinions, and has given formal instructions to the police not to interfere with automobilists unless the speed is actually dangerous. In deserted spots he places no restriction whatever on the pace.

New York City is in all probability to have a public service of 5,000 steam coaches, each capable of seating fourteen passengers. A Bill is now being introduced into the New York State Legislature defining the privileges of companies operating stage lines. The Mobile Rapid Transit Company, recently formed, have arranged in conjunction with Mr. J. Brisben Walker, of the Mobile Company of America, to take full advantage of the facilities of this new measure if passed into law.

A 20-mile straightaway run on the Florida Beach in the United States is available for automobile races and trials. This course includes a level 6-mile stretch of hard beach between Daytona and Ormond. Arrangements are now being made to hold automobile races and record trials at this spot during the second week in March, it being supported amongst others by the Chairman of the Racing Committee of the A.A. Association. The full length of this famous beach extends for fully 30 miles, and is from 400 to 600 feet wide at low water. There are no stones whatever, and the sand is said to be nearly as hard as asphalte and very smooth.

Much enthusiasm prevailed at the fourth Annual Dinner of the A.C. of America, held at the Waldorf Astoria recently. The speeches were enlivened by a somewhat sensational entertainment item in the form of the sudden appearance of an electric roundabout dashing round the banqueting room, occupied by one Will Carleton, a music hall artiste, disguised as "Mr. Dooley," the humorous philosopher, who at once gave voice to a topical song, adapted to the well-known style of "Mr. Dooley." In the words of an American contemporary "it was an electric success, and started a wave of pleasantness that reached out in a Marconi penetrability over all the hall." About 300 guests were present, with President Albert R. Shattuck in the chair, supported by Col. A. A. Pope, Col. John Jacob Astor, the Hon. J. W. Armstrong, the Hon. Theodore Kluttz, the Hon. J. P. Allds, Messrs. Winthrop E. Scarritty, E. C. Lee, Wellard A. Smith, S. Ford, W. Pierpont White, J. E. Hedges, C. E. Adams, &c. The President, Senator W. W. Armstrong, Messrs. J. E. Hedges, John Roy Stone, and Windsor P. White spoke of the good roads movement and other serious subjects. Mr. Simeon Ford, who apparently has good reason for the reputation which he has earned of being a wag, speaking in a livelier vein, contributed some extremely humorous remarks.

After a few personal points of local interest Mr. Ford continued as follows: "Our streets have always been hard enough to navigate, heaven knows, but nowadays with the electric trolleys and the automobiles added, pedestrianism has degenerated into a mere succession of frenzied leaps and convulsive stops, and our progress to and fro is like that of the startled fawn, which

> Bounds from crag to crag,
> Hearing the hunter's horn.

Shakespeare, who was up to date and a little ahead of it, said—

> No man means evil but the devil, and
> we shall know him by his horns.

This eternal horn blowing is a nuisance and a nerve-destroying crime, and is unnecessary and silly. I have noticed that the smaller the auto the bigger the horn. To hear one of these little tin washboilers, with a 1-horse power engine and a 12-horse power horn, and a 20-mule power driver, coming down the avenue you'd suppose that Gabriel with his trump had broken loose at last, and when you look up, expecting to see a trump, you see nothing but a two-spot. I don't claim that every man who runs an auto is a jackass, but I do claim that every jackass runs an auto. I run one myself. The first machine I looked at was small, simple, and inexpensive. It had but one cylinder. The salesman said that was an advantage. He said a four-cylinder engine would get out of order four times as often. This machine had a handle on the side like a barrel-organ. He showed me how to make it go fast and slow and stop and start, and all the while the machine stood in the store. A child of ten years could run it, he said. 'Now, if you want to get out of a tight place,' he said, 'get a sudden move on—you touch this lever, called the accelerator.' He touched it and with that something went wrong, and the handle I have alluded to flew around and smote him violently in the abdomen. When he came to I told him a child of ten might run the machine all right, but the child would have to have a very strong stomach." Papier maché silvered reproductions of the President's Cup in the American Reliability Trials were carried away with much enthusiasm by each guest.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

Offices: 44, St. Martin's Lane, London, W.C.

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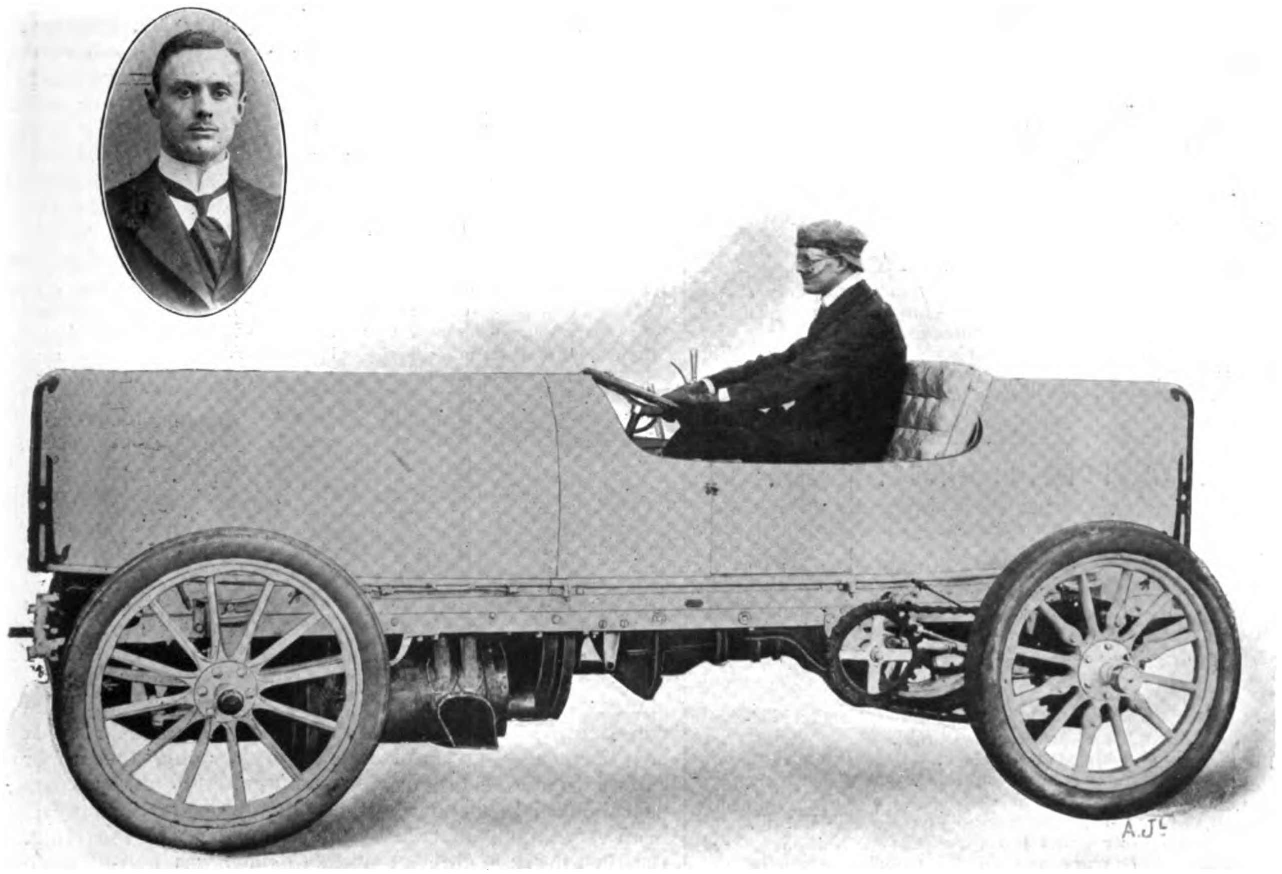

Photograph of car by Argent Archer, Kensington.

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Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.	
*March 13 ...	"The Motor Problem a Road Problem." Paper by Mr. W. Rees Jeffreys.
March 21-28 ...	Cordingley and Co.'s Exhibition, Agricultural Hall.
*April 10... ...	Eliminating Race for Gordon-Bennett Race.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14 ...	Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
*June 13	Gymkhana at Ranelagh.
*July 9	Gordon-Bennett Cup Race.
*July 11	Speed Trial at Dublin.
*July 13	Start for International Tour through Ireland.
*July 15	Motor Boats Race, Queenstown Harbour (Alfred Harmsworth Challenge Cup).
*July 18	International Hill Climbing Trial at Belfast (Henry Edmunds Trophy).
*August	Tourist Motor Bicycle Reliability Trial.
*September ...	The 1,000 Miles Trial.
1904.	
...	*Light Van Trials.
*Feb. 12-24 ...	Crystal Palace Exhibition.

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* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
March	"Criterium du Quart de Litre" (*L'Auto.*)
March 8-22 ...	Berlin Automobile Exhibition.
March 16-30 ...	Vienna Automobile Exhibition.
March 17-28 ...	"Criterium des Transports Automobiles." 1,072 kiloms. (*La France Automobile*). Classes A, B, E.
March 22-28 ..	Ditto. Classes C, D, F, G, 1,014 kiloms.
March 28-April 5	Nice Automobile Week.
April 16-20 ...	A. C. de Touraine Tourist and other Trials.
May 14	Paris-Madrid. Start of Tourist Section.
May 16-24 ...	Stockholm Exhibition.
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June ...	Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-23 ...	Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 25-July 1 ...	Aix-les-Bains Auto Week (Auto Club du Rhone).
July	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
July 5	Laffrey Hill Climb.
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August	Circuit des Ardennes.
September ...	Udine Exhibition (Italy).
Oct. 15-21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

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PASSING EVENTS.

THE AUTOMOBILE CLUB—PATRON, HIS MAJESTY KING EDWARD VII.

EVERY automobilist in the country will learn with pleasure that His Majesty King Edward has graciously consented to become the Patron of the Automobile Club. His Majesty has been a patron of the motor vehicle almost as long as it has existed. His influence has been considerable on the development of the movement. It has been very powerful indeed in inducing the upper classes to adopt the new locomotion. For many years past the social procedure of certain circles in Society has been very largely affected by the example set by the King. It is just in those circles that there once was considerable prejudice against the motor car. Had His Majesty's example tended to foster and encourage these prejudices, there is little doubt that a much longer period would have elapsed before they would have been overcome, and before the motor car would have established itself in fashionable favour to the extent which it has already done. King Edward's influence has always been on the side of progress, enlightenment, and common sense. His attitude in regard to the automobile, his readiness to perceive and profit by its advantages and pleasures, has been only a special example of his enlightened perception and breadth of view. But it has had enormous influence on the industry, and comes home with special force to all who are interested in promoting its welfare. King Edward's gracious act in agreeing to be Patron of the Automobile Club is merely the crown and seal to his action and attitude in regard to progress generally, and the automobile movement in particular. But it will be extremely welcome to every automobilist, and particularly to every member of the Club. As His Majesty has thus consented to ally himself, so to speak, officially with the automobile movement, it will not perhaps be too much to hope that he may see his way to favouring next year's Exhibition by an official visit.

◆

"THE COMING OF THE MOTOR."

Mr. Henry Norman's article in the March number of his new monthly magazine, *The World's Work*, is a pæan in praise of the motor car. Mr. Norman has all the enthusiasm, one might almost say the fanaticism, of the recent convert, for the motor car. His article, as all he writes, is eloquent and terse almost to the point of epigram. He takes a comprehensive view of the pleasures and advantages of the motor car, and of the manner in which it is revolutionising life and social conditions at present, and paints in a few rapid but telling touches what its development is likely to effect in the future. Mr. Norman's enthusiasm for the motor car is mainly due to the manner in which it enables us to get much more out of life than was possible before its advent. He puts it in this way. The radius of action of a man living in the country and owning a horse is, Mr. Norman says, about 12 miles. That is to say, any place situated within 12 miles from his residence in a straight line is accessible to him. A circle whose radius is 12 miles contains 452 square miles. With an ordinarily efficient motor car the owner's radius is 30 miles at least. A circle of 30 miles radius contains 2,375 square miles. In other words, Mr. Norman concludes that the possession of a car by anyone multiplies the contents and the effective sphere of his life by more than six, that is, as compared with a horse owner. The ratio is much greater as compared with a man who does not keep a horse.

◆

The article referred to is full of delightful remarks. High-powered cars, he says, "in the hands of a man who really understands them are under perfect control, but it is almost criminal for anybody to drive them who has not these qualifications." Again, "unless a man is in the habit of hammering his thumb, or drawing tin-tacks with a chisel, there will be no need whatever for him to keep a driver, and, therefore, the little car will cost them less a year than a pony and trap, and do five times the work." The author is very dogmatic about the future. We agree with him that we are on the eve of a more momentous change than that inaugurated by Watt and Stephenson. We agree with him, too, that the decentralizing effect of the car will be to re-develop and re-vivify country life, and that ten years hence there will not be a horse left in London except for riding and police and military purposes, and we need not say we hail the advent of that day, and the absence of the daily 5,000 tons of manure which, as Mr. Norman says, are now deposited on the London streets, with a sense of coming satisfaction. But we do not agree that the motor will kill the railway, any more than the railway has killed off the horse. In fact, after reading Mr. Scott Montagu's paper, which we dealt with editorially last week, it is impossible to take that view, and it is impossible to avoid a smile at the notion that when railway companies cease to pay dividends their shareholders will compel the State to take them over. We cannot help thinking, however, that Mr. Norman's belief that the motor will kill the tram has a good deal in it. At any rate we hope so.

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Mr. Norman's article is a powerful tract in favour of automobilism, and is calculated to convert nearly everybody who reads it. At the same time he is slightly open to criticism here and there, mostly through being so very enthusiastic. Thus, where he says, "A car of twenty horse-power, capable of carrying four passengers at forty miles an hour, can hardly be heard by those on board; in fact, to be quite frank, its extreme silence is a new element of danger, as the only notice of its approach is the horn of its driver." Considering that Mr. Norman confines himself entirely to the petrol car, there are people who might regard this statement as savouring of exaggeration. There are some petrol cars of which it is true, and enormous progress has been made in the last few years in the elimination of noise, but still their noiselessness has not yet become positively dangerous. Mr. Norman also elects to ignore the steam car practically entirely—rather an unfair attitude to take up. Still his article is so enthusiastic, so encouraging, so sprightly, so epigrammatic and so well calculated to make converts to the cause, that trifling omissions of this kind may be forgiven.

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THE ROADS ENQUIRY.

The approaching labours of the Royal Commission which has been appointed to enquire and report on London locomotion and what means should be adopted to render it a little less chaotic, congested, and anarchical than it is, continue to excite a good deal of general interest in the Press. We have dealt with the subject from time to time, and now our contemporary, the *County Gentleman*, devotes to the same question a thoughtful and well-considered article taking very much the same views of the situation in general that we ourselves have put forward. We have criticised the composition of the Committee. Our contemporary (to a large extent the mouthpiece of the Roads Improvement Association) is not very sanguine as to the probable outcome of its labours. It concludes with this pertinent observation:—

> Modern civilisation seems to have called into existence forces and institutions none of which are sufficiently powerful to carry the community along with them, but all of which are strong enough to prevent each other achieving very much. Sometimes, however, a step forward is made when a body of men, ably led, make sacrifices to secure the victory of an idea. In the case of the movement for better roads, there are as yet no indications that even those most interested are willing to make the efforts necessary to the triumph of their cause.

That is the case in a nutshell. Whatever may be the need of improvement in country districts, and in some parts of the country the roads are inadequate enough, it is in the towns and mainly the Metropolis that the difficulty is really acute. London has allowed itself to be throttled, and nothing but the widening of existing main thoroughfares and the construction of new ones will ever satisfactorily solve the difficulty. This will entail enormous capital outlay and expense. Improved regulations for traffic on existing streets can of necessity be nothing more than palliatives. Sooner or later the sacrifice will have to be made. It might have been to some extent obviated by forethought and consideration. It cannot be obviated now, and the sooner its absolute necessity becomes generally recognised the better. In so far as the labours of the Committee tend to bring this fact home to the public and the authorities, their labours may have some value. With the growth of the automobile the number of vehicles on the streets will grow greater and greater, and though their greater speed and manageability will tend at first to improve matters, the number of vehicles will certainly increase so much that that effect will be neutralised. Sooner or later the pruning knife will have to be applied, and with no sparing hand. The longer the evil day is postponed the heavier the bill will be.

THE MILITARY AGAIN.

WE referred in a recent number of the Journal to the proposal to employ the military from the Curragh Camp to hold the course during the Gordon-Bennett Race in Ireland, when we pointed out that the proposal, if carried out, was not calculated to propitiate the Irish country people. We are sorry to find this suggestion again put forward in an article in the *Daily Mail* of recent date dealing with the prospects of the race. The passage in question reads:—

> "It is hoped, moreover, that the Continental practice of invoking the aid of the military may be followed. The Curragh Camp, as it happens, is placed in the very centre of the circuit over which the race will be run. Officers and men alike, of course, will turn out *en masse* to see the race, and there seems no reason why they should not at the same time serve a useful purpose by lining the course. Then, too, there is the Royal Irish Constabulary to depend upon."

We cannot at all understand why the Continental practice in this manner is a thing that we should hope to see followed. Most of the Continental nations are as proud of their military as a child with a new box of tin soldiers. In England we are proud of them and very properly, but we do not particularly care to see them employed to do police duty. In Ireland, unfortunately, the military are not popular with the country people. They have been too often in evidence at evictions and other unpleasant celebrations. We say again, as we said before, that if they are to be employed to keep the road we believe there will be friction, if nothing worse. In any case the people will be annoyed. Should the soldiers with their officers turn up from the Curragh Camp in their private capacity to see the race they will have the best of receptions; it will be quite different if they come there as policemen. The Irish people have behaved so well over the whole question of the race, and hailed the proposal with such enthusiastic support from the very first, that we really think their feelings in this matter ought to be consulted. Needless to say the course will have to be kept, but Committees are being formed by the County and District Councils to do so. No doubt the constabulary will also assist, but they will then be under the direction of the local authorities, and they understand the people they have to deal with. They are all countrymen themselves. Though they may have come into conflict with the people in the past, they understand them and do not tread on their corns unnecessarily. The country people will be quite happy and even pleased to obey the police when they find them acting under District and Parish Councils who are one with themselves. They won't like it at all if soldiers are employed for the purpose—we do not fancy the soldiers will like it either.

THE LATEST CONCERNING THE EDISON BATTERY.

THE Edison battery continues to make its periodical appearances—in the technical press. We are now positively assured that before the leaves are green upon the trees this spring the public will be able to purchase it in quantities. The original claims made for it seem to have suffered a good deal of abatement. When Dr. Kennelly first read his paper we were assured that 14 watt-hours per pound of cell would be obtained from the battery. We were not struck dumb with wonder at this, as more is already obtained from lead batteries. Now, however, we find that the weight efficiency claimed has gone down a good deal even below 14 watt-hours per pound, and is now given as 11·2 watt-hours per pound. It may be that this is due to experience having proved that it is necessary in practice to construct the battery more substantially than was in the first instance supposed, or it may be due to a gradual diminution of capacity under working conditions. In any case the result is something of an anti-climax, as from 10 to 12 watt-hours per pound per cell can be obtained with any decently-constructed lead battery. Some ingenious arrangements have been adopted in the more recent forms of cell. Amongst these are a funnel for pouring in the electrolyte, which practically forms a non-return valve, so that the liquid can be poured in, but if the cell is tipped over none of the electrolyte will run out. The funnel is permanently attached to the cell, and is combined with the fluid indicator to show when it is full up. The funnel is, of course, employed not only for pouring in the electrolyte, in the first instance, but also for adding from time to time the amounts of water required for replacing the electrolyte lost by gasing on charge. A gas-relief-plug has also been adopted on the Davy miners lamp principle, provided with several layers of gauze, so that if a light is brought near the cell there is no danger of igniting the explosive mixture of gases inside it. This cap is also constructed in such a way that if the cell is turned over the impact of the liquid closes it and prevents any leakage. Mr. Edison has been talking extensively on the subject recently, and according to reports he maintains that numbers of the batteries have been thoroughly tested to the extent of running cars for 3,000 miles. Of course, that is not a very elaborate test. He also states that the batteries after these 3,000 miles seemed on inspection better than at the start. "Better" is rather suspicious. One can understand their being as good. But, unless "better" means an increase of capacity, it is difficult to understand in what way the improvement made itself apparent. Increase of capacity happens with lead cells under similar circumstances also, but with most batteries it is the signal of a speedy demise. Finally, Mr. Edison declares that he can guarantee that with his new battery runs of forty miles per charge will be regularly attainable. That again is nothing phenomenal, though when he says that this is to be compared with twenty-five miles, the present average of the lead type of cell, we would point out that in this country three times that range is not extraordinary.

THE Glasgow to London Non-Stop Trial being organised by the Scottish Automobile Club (Western Section), will take place on May 13th and 14th, the first stage being from Glasgow to Leeds, and the second, Leeds to London.

THE COTTEREAU PETROL VEHICLES.

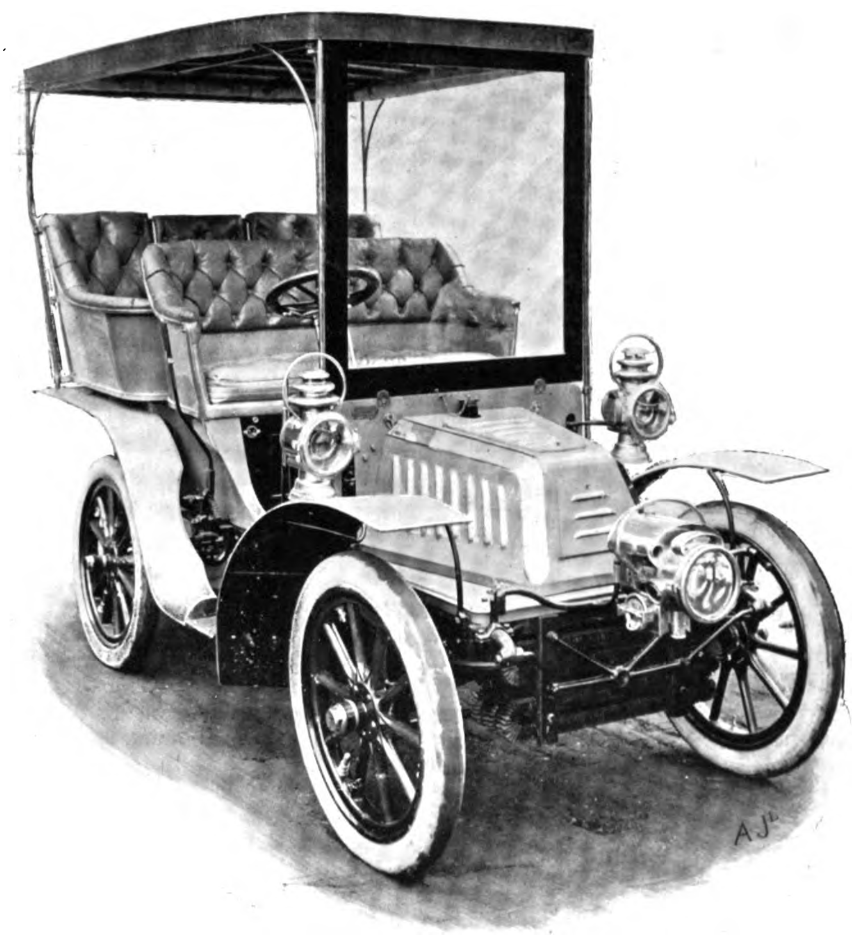


FIG. 1.—7-h.p. Cottereau Tonneau, with removable top and wind glass.

THE Cottereau cars, for which Messrs. McNeil, Hutchison, and Borthwick, of Manchester, have taken up the agency in this country, are made in four different sizes, and possess several interesting features. Beginning with the smallest, the 5-h.p. voiturette is fitted with a single-cylinder engine, the normal speed of which is 950 revolutions per minute. The bore of the cylinder is 105 mm., and the stroke 110 mm. The frame is of tubular construction, and the power is transmitted from the change-speed gear to a live axle by a single chain. The engine and gearing are arranged in the usual positions with a main friction clutch between them. The car has three forward speeds and a reverse, and can travel at any speed up to 26 miles per hour. The engine is fitted with a mechanically-operated inlet valve which is interchangeable with the exhaust valve. The weight of the chassis is about 6 cwt.

The 7 and 10-h.p. vehicles have twin-cylinder motors in which the two cylinders are mounted at an angle to one another on the crank-chamber. The bore and stroke of the 7-h.p. engine are 85 mm. and 105 mm. respectively, and of the 10-h.p. are 90 mm. and 110 mm. respectively, the normal speed of both being 1,200 revolutions per minute. The 7-h.p. engine, fixed in position in front of the car, is seen in Fig. 2, and the complete vehicle is represented in Fig. 1. The two cylinders are not in line with one another and their connecting rods are, therefore, quite independent of each other on the crank-shaft. The two chassis, apart from the size of the motors, are similar in all respects, and the method of transmitting the power from the gear-box to the live-rear-axle by a single chain is employed on both of them. The smaller is geared up to 26 miles an hour, and the larger to 30 miles an hour. The frames are tubular, and the engine and gear-box are carried on inner longitudinal members of it. The change-gear gives three speeds and a reverse, and a direct-through-drive up to the bevel gearing is obtained on the top speed. The small cross-shaft, which in this gear-box takes the place of the usual differential countershaft, and from which the chain passes to the rear-axle, carries a brake-drum on the opposite end to that upon which the driving sprocket is fixed. A foot pedal applies this brake, and a side lever operates the brakes on the hubs of the rear wheels; all three brakes are double-acting.

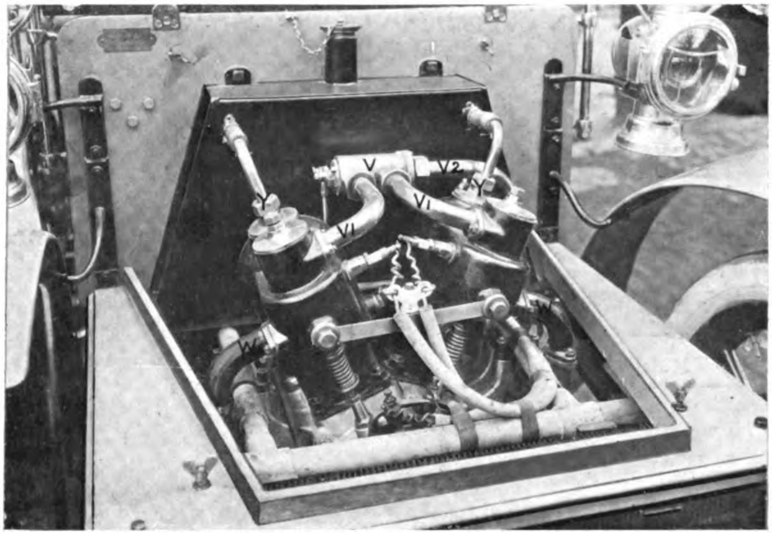
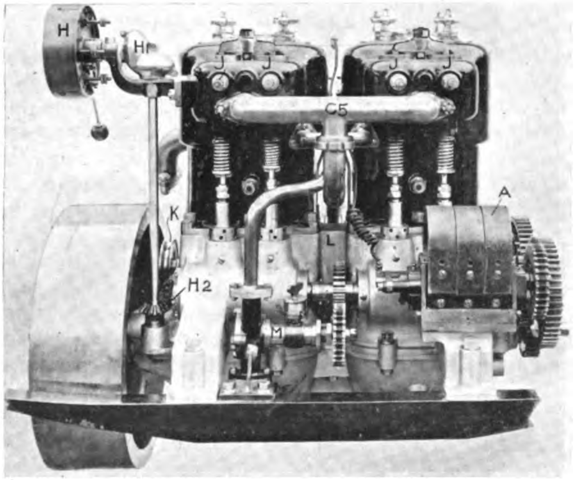
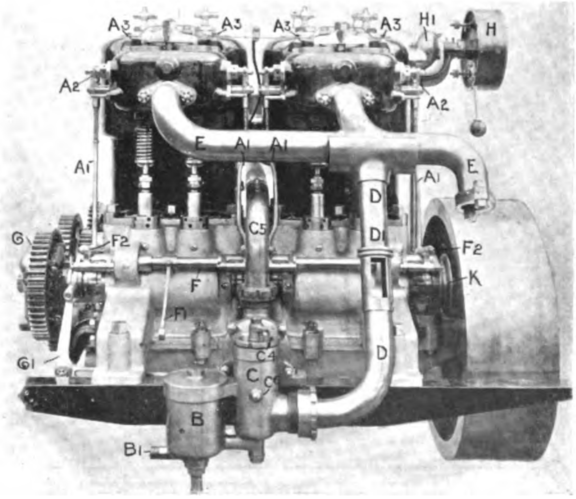


FIG. 2.—View of Engine in 7-h.p. Cottereau Car.

The inlet valves on these V-type engines are atmospherically operated, and can be removed without disturbing the induction pipes, V^1, which lead to them from the throttle-valve, V. In Fig. 2, the pipe from the carburettor to the valve is marked V^2. An automatic centrifugal governor is fitted in the flywheel, and is connected so as to regulate the speed of the engine by controlling the throttle-valve, subject to the usual action of an accelerator pedal. Separate exhaust pipes, W, are taken from each cylinder, and a waterpipe, Y, leads from the top of each of the jackets into the supply tank, fixed in front of the dash. A curious arrangement on this engine is that the lever on the steering pillar, which advances the time of ignition, also varies the time at which the exhaust valve opens and closes. For this purpose the cams which operate the exhaust valves and the contact-breakers are mounted together on the half-speed shaft, and are caused to be advanced or retarded about the shaft when the controlling lever is moved. By this means the engine is caused to act as a powerful brake when running down hills, and it is also found that its speed can be reduced to a lower point than usual when the car is standing still or running on the top gear in traffic. These cars have wooden wheels, and are shod with pneumatic tyres, 750 x 85 mm., and 760 x 90 mm. on the 7-h.p. and 10-h.p. models, respectively. The weight of the chassis are 8 and 10 cwt. respectively.

The 16-h.p. vehicle has a 4 cylinder motor, the bore of the cylinders being 92 mm. and the stroke 122 mm. Two designs of engine are made, the one having atmospheric inlet valves, and the other having mechanically operated valves. The main frame is constructed of wood and steel, and the engine and the change-speed-gear are carried on a separate underframe. The gearing is of the Panhard type, and the power is transmitted from a differential countershaft to the rear wheels by side chains. A direct-through-drive is obtained on the top speed, and the car is geared up to 38 miles an hour. The general construction of the chassis does not differ materially from other well-known types, and the workmanship appears to be very good. The wheel-base is 7 feet 8 inches, and the gauge 4 feet 4 inches. The tyres are 870 mm. by 90 mm., fitted upon artillery wheels. A honeycomb radiator forms the front of the bonnet, and the circulating pump is gear-driven. The usual provisions are made for lubricating the various parts, and a specially neat grease feeder is mounted on the dashboard. It is connected with the various bearings by six separate pipes, and is constructed in such a manner that the driver can force the grease to whichever bearing he wishes. The handle is, as usual with such lubricators, turned right-handedly in order to screw down the plunger upon the grease, but when it is turned left-handedly it does not unscrew the plunger; instead of doing





THE 16-H.P. COTTEREAU ENGINE.

FIG. 3.—View showing Inlet Valves, Magneto, and Circulating Pump.

FIG. 4.—View showing Exhaust Valves, Low-tension Igniters, and Carburettor.

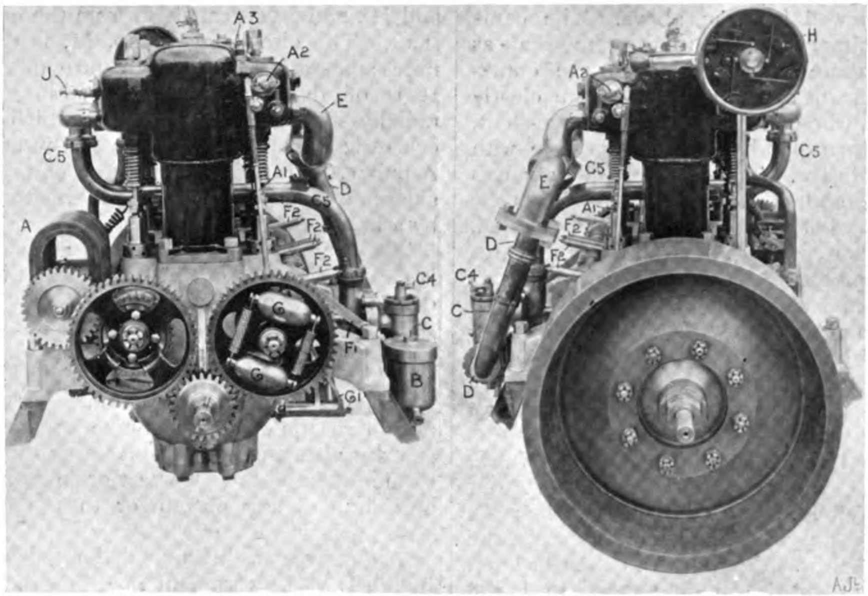


FIG. 5.—Front End View. FIG. 6.—Rear End View.

The 16-h.p. Cottereau Engine.

so, it brings a small pointer opposite to indicating numbers on a dial, and the driver can thus bring the pointer opposite any desired number from 1 to 6. As soon as the pointer is brought opposite to the required number, a right-handed turn of the handle forces the grease down to that bearing.

The new 16-h.p. engine is illustrated in Figs. 3, 4, 5, and 6, where it will be seen that each pair of cylinders is bolted separately to the aluminium crank-chamber, that a low-tension ignition system is fitted, and that the inlet valves are operated mechanically. The inlet valves are arranged on the right hand side of the cylinders, and the exhaust valves on the left, the former being seen in Fig. 3, and the latter in Fig. 4. The cam-shafts, which operate these valves, lie on each side of the crank-chamber, and are driven by spur wheels, on their forward ends, which mesh with a common wheel of half size on the crank-shaft. The cams themselves are enclosed, and the sliding rods which lift the valves are fitted with small rollers at their lower ends. The rollers ride on the cams, and the guides in which the rods slide are fixed in place by two circular nuts having tommy-holes for tightening them up. The construction of the guides is unusual as, a small internal chamber is provided in such a manner as to cushion their upward movements by compressing air between the sliding and the fixed parts. The low-tension make-and-break igniters are fitted in the walls of the exhaust valve chambers, the moving portion, A^2, being fixed separately in the side, and the insulated

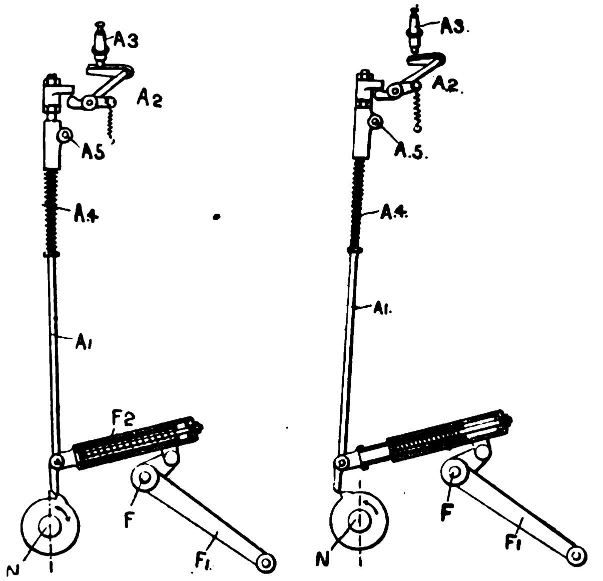


FIG 7.—Showing position when firing normally.

FIG. 8.—Showing action of safety device, in case of reversal of rotation.

Diagramatic Views of Low-Tension Igniter and Timing Device.

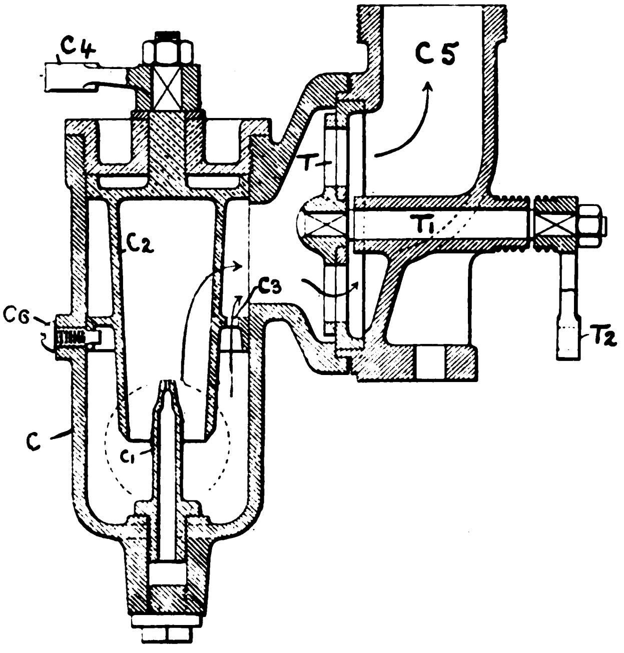


FIG. 9.—The Cottereau Carburettor.

Section through Mixing Chamber and Throttle Valve.

contacts, A^3, being screwed in from above. The cams which operate these igniters are fixed to the same shaft as the exhaust cams, but are not enclosed in the crank-chamber. The arrangement of the igniters is more clearly shown in Figs. 7 and 8, where N represents the cam-shaft, and the other letters correspond so far as possible with those in Figs. 3 to 6 inclusive. The cam normally revolves right-handedly, as indicated in Fig. 7; it, therefore, lifts the rod, A^1, against the action of the spring, A^4. When lifted, the projected arm, on its upper end, lifts and then releases a corresponding arm on the rocking-spindle which passes through the plug, A^2, thus causing the moving contact in the combustion-chamber to press against the insulated contact, A^3, and to fly back from it. The guide through which the rod, A^1, slides is pivotted at A^5, and the lower end of the rod is connected through a telescopic fitting, F^2, with an arm projecting from the shaft, F. The time of ignition is varied by moving the lever, F^1, and the same shaft, F, is connected in a similar manner with all four igniters. When the lever, F^1, is moved, it causes the rods, A^1, to swing about the pivots, A^5, and, consequently, the cams begin to lift (and release) the rods, A^1, earlier or later, thus "timing" the ignition. It will be noticed in Fig. 8 that if through any cause the engine, and therefore the cam-shaft, N, should rotate in the opposite direction, no damage would be done, as the arrangement of parts provides for this contingency. Although the cam would move the lower end of the rod, A^1, about the fulcrum, A^5, yet a spring in the telescopic fitting, F^2, allows it to do so safely, and causes it afterwards to return to its normal position. The magneto, A, is fixed to the crank-chamber and is driven by spur-wheels (built up of brass and fibre) from the inlet-cam-shaft.

High-tension ignition plugs, J, are fitted into the combustion-chambers immediately above the inlet-valves, and inspection-covers, each pair of which is held down by a yoke piece and a single nut, are arranged above each valve. The carburettor is fixed on the left side of the motor. It takes warm air through the pipe, D, from the neighbourhood of the exhaust pipe, E. The pipe is provided with a cylindrical valve, D^1, by which an adjustable quantity of cold air can be admitted.

The carburettor is of the float-feed pattern. The petrol enters the float-feed chamber, B, through the pipe, B^1. The mixing chamber, C, as also a throttle valve, T, which is fitted between it and the mixture supply pipe, C^5, is shown sectionally in Fig. 9. Referring to this drawing, the petrol enters the mixing chamber through the nozzle, C^1. A certain quantity of air passes up between it and the conical fitting, C^2, and the rest of it passes outside it, and goes through the holes, C^3. The amount of air which finds its way in either direction is regulated by the lever, C^4, which moves the part, C^2, about its axis and acts as a regulating valve. Its range of movement is restricted by a small screw, C^6, and it enables the driver to vary the richness of the mixture. The throttle valve, T, is operated by the lever, T^2, which is connected with it by the spindle, T^1.

The governor is mounted in the spur wheel on the front end of the cam-shaft. It regulates the speed of the engine by controlling the throttle valve, T, through the system of levers, G^1 (Figs. 4 and 5). The normal speed of the engine can, as usual, be varied by an acceleration pedal, which adjusts the tension of a spring acting against the governor. The commutator, H, which is employed in conjunction with the high-tension ignition plugs, J, is mounted upon the dashboard of the car, and is driven through bevel gearing, H^1 and H^2, and a vertical shaft, from the end of the inlet cam-shaft. The circulating pump, M, is driven by brass and fibre spur-wheels from the centre of the same cam-shaft. It is of that type in which sliding vanes are carried radially in a cylindrical block, which is itself mounted eccentrically, and is rotated in the outer cylindrical casing. A pulley, K, is fixed on the rear end of the exhaust-cam-shaft and is used for driving a lubricator, on the dashboard, by a belt.

The general construction and appearance of this engine is clearly shown in our photographs; it is well made, and the design throughout is pleasing.

THE SPEED LIMIT.—IRELAND LEADS.

"SUBJECT to the provisions of the Act as to speed, he shall not drive the light locomotive or motor bicycle at any speed greater than is reasonable and proper having regard to the traffic on the highway, or so as to endanger the life and limb of any person, or to the common danger of passengers."

The above sensible amended regulation has been made by the Local Government Board of Ireland, and will come into force on the 31st instant. In addition, the absurdity of treating a motor bicycle with a trailer attached as a "light locomotive," and restricting its speed to 6 miles per hour, has been remedied. Both it and its bigger brother, the car, can therefore now travel at 14 miles per hour in Ireland, the maximum speed specified in the Light Locomotives on Highways Act of 1896, subject, of course, to the regulation which we give above, and that the trailer has an independent brake. In towns and cities also the speed must be reduced to 6 miles per hour. The new rules are issued over the signatures of Mr. Wyndham and the President of the Local Government Board, Sir H. S. Robinson.

"THE MOTOR VOLUNTEER CORPS."

THE motor volunteer corps, the organisation of which was commenced by Mr. Mark Mayhew last summer, and the progress of which has been dealt with by us from time to time, has received its final official recognition this week, when according to the *London Gazette* of March 3rd,

> "His Majesty has been graciously pleased to approve of the formation of a Volunteer Corps, to be designated "The Motor Volunteer Corps."

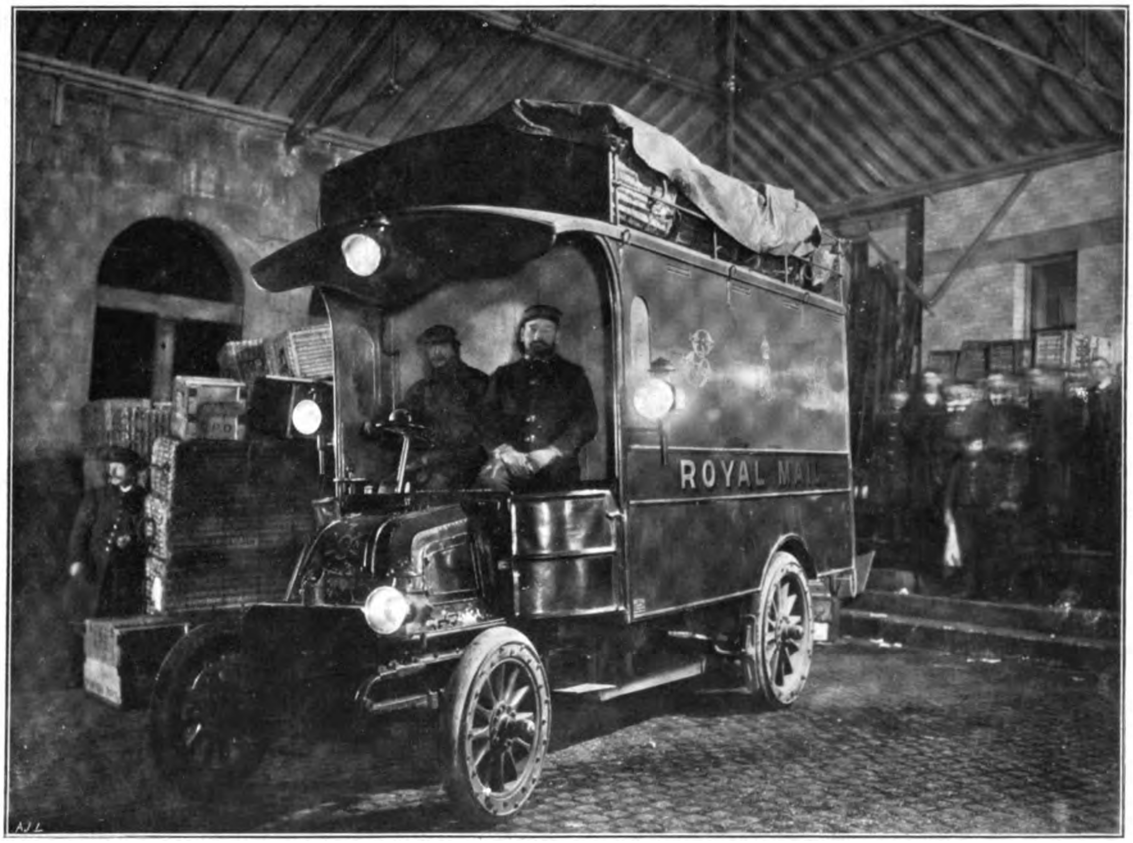
* * *

WE have frequently maintained that there is one law for the rich and another for the poor. In this we are not alone. A scandalous example was provided in the police court at Manchester recently, in which the driver of an electric tramcar was summoned for careering along with his lumbering vehicle at the speed of nearly twenty-three miles an hour. He was convicted, the proofs of the rate he attained being satisfactory, and was duly fined the sum of *10s.* Considering the danger involved in a tramcar proceeding at this rate, its enormous weight, and the fact that it is incapable of getting out of the way of anything that may happen to be in its course, considering also that for every merely technical violation of the law in out-of-the-way places where nobody is imperilled, automobilists are usually fined £5 at least, we again state, and have pleasure in maintaining, that there is indeed one law for the rich and another for the poor, one law for the automobilist and another for the tramcar driver.

HIS MAJESTY'S MAIL BY MOTOR VAN.

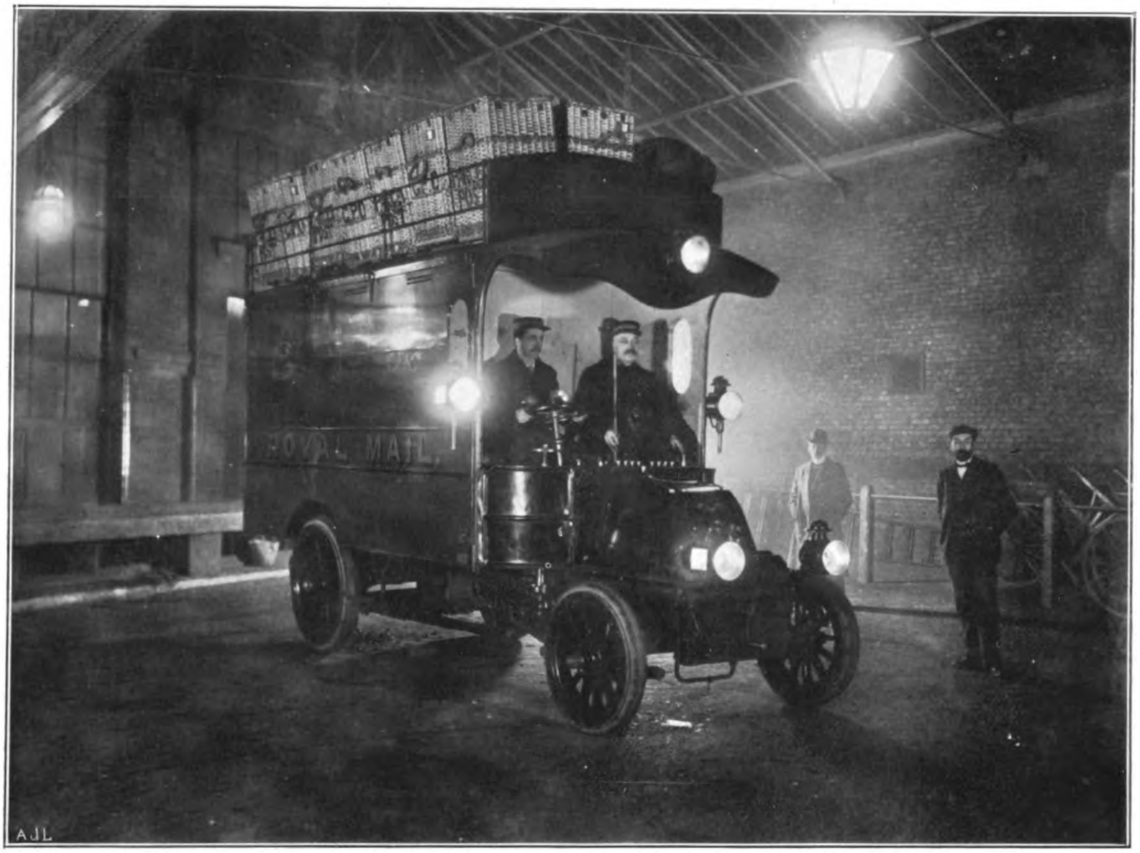
Many attempts have been made to fulfil the requirements of the postal authorities for carrying the mails and dealing with the light parcels traffic of this Government Department, but in nearly all cases they have resulted in the service being discontinued, and up to the present no data of value have been obtainable in regard to the actual cost of running, or the causes to which the abandonment of the experiments was due. It is, therefore, with the greatest satisfaction, that we are able to publish the following important report, which we have received from Mr. H. G. Burford, the General Manager of the Milnes-Daimler Company, referring to the service of postal vans, which have now been satisfactorily running for some months between Manchester and Liverpool. It will be seen that for all practical purposes there has not been the smallest hitch in the service, and that after the three weeks of trials with dummy loads the postal authorities were sufficiently satisfied with the results to arrange for the regular mails to be carried by the motor vans. Only three vans were employed, making the test all the more severe. These three cars, of which two were always in service, during the months of November, December, and January covered a total distance of 5,827 miles, the average petrol consumption for the double journey between the two towns of 80 miles amounting to about 9 gallons. In practice, of course, these vehicles would be capable of covering far longer distances, as they were working considerably under their full capacity for the greater part of the time they were in use. It is to be hoped, therefore, that as it has now been clearly established that the motor vehicle for regular service is as reliable and more efficient than the horse-drawn vehicle at present employed, its adoption by the Government will be general. As to the advantages obtained by the increase of speed no two opinions can exist.

The tyre question, as will be seen, has not proved a serious difficulty, and we reproduce a section of both the back and the front tyres, as supplied by the Goodyear Tyre and Rubber Company, which were used on the vans. On the driving wheels 5-inch endless solid tyres were employed, and on the front wheels 4-inch. These tyres are immovable when on, and by their method of attachment practically form part of the wheel. Unless the flanges are removed they cannot be pulled out or ridden out by ordinary means. The tyre is made under hydraulic pressure, and (owing to the large quantity of rubber in them) is very resilient. The rubber is almost double the density of ordinary commercial rubber; in fact, it very nearly approaches that of pure rubber, whilst being exceedingly durable. The base of the tyre is strongly constructed, and a firm foundation is thus secured. We understand that loads of 12 tons have been successfully carried on Goodyear tyres, and that they have proved themselves suitable for very heavy work, provided reasonable speeds are not exceeded.



The Milnes-Daimler Postal Van starting from the Liverpool Post Office at 10.15 p.m., accompanied by a guard armed with sword and army service revolver.

From January 30th, the final date of the Report which we publish, up to February 21st (the date upon which Mr. Frost Smith concluded his engagement with the Motor Haulage Company), we understand that these vans have continued their official delivery of mails without any mishap, and that the machinery was then running in the most perfect order, better if anything than when the original start was made. No signs of wear were apparent, and there should be no reason for their successful running being interrupted for an indefinite period. The two very interesting photographs which we reproduce show the vans just about to start at 10.15 p.m. from the Manchester and Liverpool Post Offices, respectively. The driver of each van is accompanied by a Post Office guard, who is fully armed both with sword and army service revolvers.



The Milnes-Daimler Postal Van starting from the Manchester Depôt at 10.15 p.m.

Copy of General Report.

February 1st, 1903.

H. G. Burford, Esq., General Manager, Milnes-Daimler Company.

DEAR SIR,—I beg to report herewith as to the running of the three Milnes mail vans owned by the Motor Haulage Company, of Manchester, from the time of the commencement of the official trials to the present date.

As you already know, the new mail van, known as No. 3, reached Manchester from London by road without the least hitch, the only adjustment made being the foot brake; total running time, 18 hours; petrol consumption, 1 gallon for 10 miles. The van weighed 2 tons, and carried a load of 2½ tons, total weight therefore being 4½ tons. On this journey top speed, of course, was mostly used, third only on severe hills, and second speed used twice only.

The period between the 27th September (date of arrival in Manchester) until the 3rd of November was spent in preparing for the road the two original 2-ton lurries, known as Nos. 1 and 2, and making the preliminary trials. This appears to be a long time, but when it is taken into consideration the amount of work done, and the difficulty of getting in work made by outside firms in Manchester, it was, in my opinion, reasonable. The alterations made to these two vehicles, as approved of by you, were:—

The substitution of rubber-tyred wheels for iron-tyred wheels.
Rearrangement of lubricating system and of brakes.
Crank-chamber connections.
Substitution of large magneto for smaller type.
Circular mud dashes for front of vehicles, &c., &c.,

also considerable renovation work.

The preliminary trials occupied one week, when the official trials commenced, the date of the first trials of the guarantee being November 4th. The trials were run precisely under the Post Office conditions. For the first three weeks dummy loads were carried, equivalent to an average Post Office load, viz., about 30 cwt. The official times of starting were as follows:—

	miles	fur.		
Manchester	18	4	depart... 10.15 p.m.	Total distance,
Warrington			arrive ... 12.36 a.m.	36 miles 2 fur.
Do.	9	6	depart... 12.41 ,,	Total time,
Prescot ...			arrive ... 1.49 ,,	4 h. 36 m.
Do. ...	8	0	depart... 1.51 ,,	
Liverpool...			arrive ... 2.51 ,,	

From the other end as follows:—

	miles	fur.		
Liverpool...	8	0	depart... 10.15 p.m.	Total distance,
Prescot ...			arrive ... 11·10 ,,	36 miles 2 fur.
Do. ...	9	6	depart... 11.15 ,,	Total time,
Warrington			arrive ... 12.30 a.m.	4 h. 36 m.
Do. ...	18	4	depart... 12.45 ,,	
Manchester			arrive ... 2.51 ,,	

From the foregoing table it is seen that the two vans start simultaneously from either end, the third van being held as spare.

The vans had on board official observers representing the Motor Haulage Company. The whole of the runs for the guaranteed month were thus observed.

First week, November 4th to November 9th, Dummy Mails.

Van No. 2 made 5 trips, each of 40 miles = 200 miles.
Van No. 3 (new van) made 4 trips, each of 40 miles = 160 miles.

Note.—No time lost, no adjustments made. Nine trips only required by management of a maximum of twelve.

Second week, Nov. 10th to Nov. 15th, Dummy Mails.

Van No. 2 made 4 trips, each of 40 miles = 160 miles.
Van No. 3 made 5 trips, each of 40 miles = 200 miles.
No time lost, no adjustments made.

Note.—Nine trips only required by management of a maximum of twelve.

Third week, Nov. 17th to Nov. 22nd, Dummy Loads.

Van No. 2 made 5 trips, each of 40 miles = 200 miles.
Van No. 3 made 5 trips, each of 40 miles = 200 miles.

Van No. 3 late on last night of week owing to air pipe in petrol tank breaking.

Van No. 2 ran without any adjustment being made, and no time was lost.

Note.—Ten trips only required by management of a maximum of twelve.

Fourth week and last of guarantee, Nov. 24th to Nov. 29th, "Mails" carried.

Van No. 1 } original { made 6 trips of 40 miles = 240 miles.
Van No. 2 } vans { made 6 trips of 40 miles = 240 miles.
No trouble of any sort and no time lost.

The four weeks' work given above completed the guarantee given by Messrs. Milnes and Co. to the Motor Haulage Company. It will be seen that one breakdown only during that period occurred, and this, I think you will agree with me, was a most unusual thing to happen. The vans were duly accepted by The Motor Haulage Company, and, at their request, I have remained in Manchester to supervise the running of the vans on their behalf.

The vans, from December 1st to December 27th, have run with splendid regularity, each vehicle doing its share of work. No breakdowns whatever occurred on the road, and *absolutely no time whatever was lost*, and the whole time H.M. Mails were carried.

The bottom speed gear shafts are the only parts that have shown any sign of wear, and this wear has been taken up when required.

Below I give a summary of work done for November and December.

Van No. 1.—Ran 4 weeks.

First week, 240 miles; second week, 240 miles; third week, 240 miles; fourth week, 240 miles.—Total, 960 miles.

No breakdown of any description.

Van No. 2.—Ran 6 weeks.

First week, 200 miles; second week, 100 miles; third week, 200 miles; fourth week, 240 miles; fifth week, 240 miles; sixth week, 300 miles.—Total, 1,280 miles.

No breakdown of any description.

Van No. 3.—Ran 6 weeks.

London to Manchester, 187 miles.

First week, 160 miles; second week, 200 miles; third week, 200 miles; fourth week, 240 miles; fifth week, 240 miles; sixth week, 240 miles.—Total, 1,467 miles.

Total distance of miles, 3,707.

The vehicles continued regularly in service during the whole of January, and the general running has been most satisfactory, together with cost of working.

Three breakdowns occurred. One due to the freezing of water in the petrol tank, happening purely through the carelessness of the driver through not carrying out instructions set him. The second stoppage was caused through the breaking of an axle end, probably due to the seizing of the collet. The third occasion was owing to the failure of the magneto, which was strained and made defective by the breaking of the two bolts securing the strap of the eccentric operating same.

The particulars of the running are as follows:—

Half week, Jan. 1st to Jan. 3rd.

Van No. 2 made 3 trips of 40 miles each = 120 miles.
Van No. 3 made 3 trips of 40 miles each = 120 miles.

First week, Jan. 5th to Jan. 10th.

Van No. 1 made 6 trips of 40 miles each = 240 miles.
Van No. 3 made 6 trips of 40 miles each = 240 miles.

Breakdown on 9th Jan., due to freezing up of petrol tanks. Full week of twelve trips.

Second week, Jan. 11th to Jan. 16th.

Van No. 1 made 6 trips of 40 miles each = 240 miles.
Van No. 2 made 6 trips of 40 miles each = 240 miles.
No breakdowns, full number of trips.

Third week, Jan. 18th to Jan. 23rd.

Van No. 3 made 6 trips of 40 miles each = 240 miles.
Van No. 2 made 6 trips of 40 miles each = 240 miles.
No breakdowns, full number of trips.

Fourth week, Jan. 25th to Jan. 30th.

Van No. 1 made 5 trips of 40 miles each = 200 miles.
Van No. 3 made 6 trips of 40 miles each = 240 miles.
Van No. 1 broke down twice, and lost one trip for reasons stated.

Summary of Mileage per Van.

Van No. 1	... ...	Total miles =	680
Van No. 2	... ...	Total miles =	600
Van No. 3	... ...	Total miles =	840

Distance for January ... ... = 2,120 miles.
Distance for November and December = 3,707 miles.

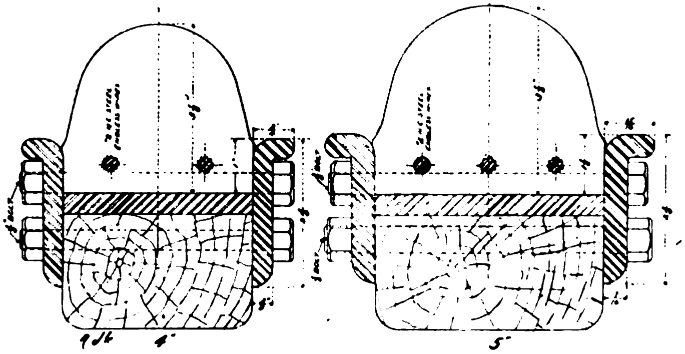
Total distance ... = 5,827 miles.

In conclusion, I can only say that the foregoing shows that the vans have behaved splendidly, and under the most trying conditions. The Manchester-Liverpool road is accepted as one of the worst mail roads in the Kingdom, the surface being extremely bad. The weather was unfavourable nearly the whole time, and the roads were terribly heavy.

The Goodyear tyres have been a revelation; they have worn splendidly; in fact, the moulding on the treads of the tyres is not yet worn down. These tyres are, of course, one of the two reasons of the success of the vans, the other being their mechanical fitness for the work.

I remain, Dear Sir,
Yours obediently,
(Signed) PERCY FROST SMITH.

P.S.—Average petrol consumption, double journey, 80 miles, 9 gallons; petrol, 9*d.* per gallon; load, 30 cwt.



Front Wheels. Driving Wheels.

Sections of the Goodyear Endless Solid Tyres used on the Milnes-Daimler Postal Vans.

* * *

BEFORE the Aeronautical Institute and Club on February 20th, a paper by Mr. W. J. Griffiths, entitled "A Novel Method of Navigating the Air," was read, which gave some interesting particulars of a flying machine built on the aeroplane principle. The machine consists of superposed aeroplanes, supported by a framework, and capable of being adjusted at any required angle. The car containing the aeronaut and machinery is suspended below, and the machine is driven by six propellers. A paper which followed, entitled "An Improved Kite or Flying Machine," by Messrs. Tarezal, Poheim, and Simko, gave the description of a kite constructed of "stepped" aeroplanes. This apparatus, if furnished with suitable motive power and propellers, could be used as a flying machine, the design of the machine giving it great stability when in the air.

THE SIMPLEX GRADUAL VARIABLE-SPEED-GEAR.

AMONGST the numerous attempts which have been made to construct a change-speed gear by which variations of speed can be made gradually, the mechanism devised by Mr. W. N. Dumaresq for this purpose is of particular interest. The difficulties of the problem are amply evidenced by the fact that no thoroughly satisfactory device of this kind has hitherto been produced, although its desirability has for many years been fully recognised by inventors. The transmission of the power from the engine to the road-wheels of a motor car in such a manner that the relative speed of the engine and the road-wheels can be varied gradually is an ideal arrangement when an ordinary petrol motor is employed, and any device which enables this effect to be obtained, without involving serious complication and loss of efficiency, reliability, or durability. will undoubtedly come into very general use when it exists.

The devices which have been tried in the past for this purpose are not only numerous, but have been extremely varied in character. Amongst these the employment of expanding pulleys has been by no means the least favoured, although it has not been our privilege to record any very marked success with any of them so far. To a certain extent the Simplex gearing may be regarded as a sort of expanding pulley, although the underlying principle upon which it is based differs materially from anything else of the kind which we have hitherto come across. The power is transmitted from one shaft to another by a belt or by a *chain*, and the effective diameters of the driving and driven wheels on the two shafts can be simultaneously and inversely varied whilst in use, but a series of small wheels over which the chain runs replace the usual pulley segments.

Mr. Dumaresq has been developing his invention for some time, and has recently completed a 10-h.p. mechanism which we have seen working very satisfactorily. The design adopted in its construction is one amongst several covered by his British and foreign patents, and we agree with him in thinking that it is the best of those he has prepared.

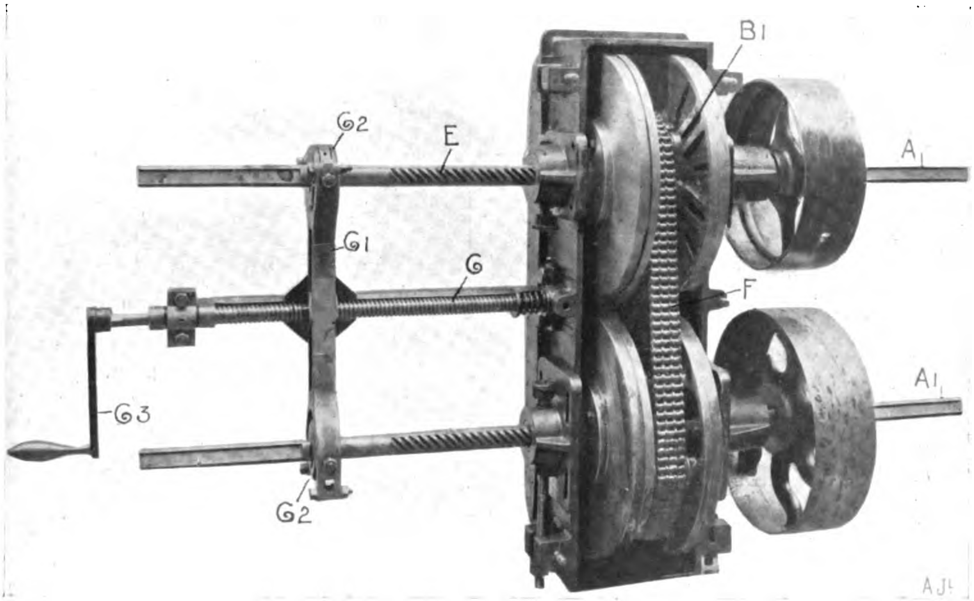
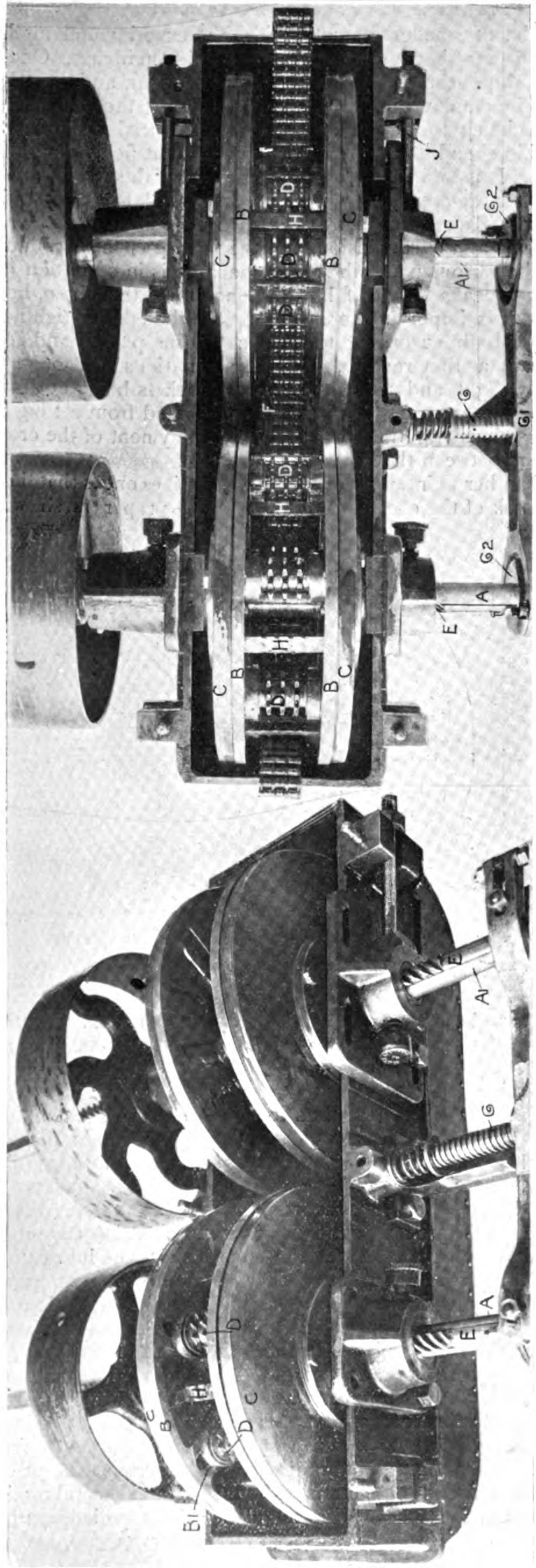


FIG. 1.—The Simplex Gradual Change-Speed Gear.

The mechanism is clearly seen in the photographs we have taken of it, and the line drawings which we also reproduce show the arrangement of the internal parts. The complete gear, but with its cover removed, is seen in Fig. 1. In Fig. 2 a closer view is obtained, and the chain has been removed. Fig. 3 shows other parts more clearly, and in this illustration the chain, though disconnected, has been partly removed only. The two shafts, A and A^1, are arranged parallel with one another in the same horizontal plane, and are carried in bearings in the gear box; the former is driven by the engine, and the latter is the driving-shaft. For the purpose of demonstrating the gear, pulleys were fitted to these two shafts and belts were used for transmitting the power to and from the mechanism. The most important parts are the two specially-constructed wheels, which for convenience we shall refer to as the expanding pulleys, and which are mounted upon the shafts and lie opposite one another in the gear-box. The power is transmitted from the one to the other by a triple-roller chain, F. The construction of the expanding pulleys is seen in the line drawings, Figs. 4 and 5, the former being a side view of them, and the latter a cross-section through one. Two discs, B and C, which lie close up against one another, form the sides of the expanding pulleys, the former lying inside the latter. The discs, B, are connected together by a sleeve, B^2, which is keyed to the shaft, A. These discs have radial slots, B^1, provided in them, the slots in the two discs being exactly opposite one another. The outer discs, C, have a spiral path, C^1, provided on their inner faces, and they are fixed to central hubs, C^2, which ride upon the shaft. The hubs, C^2, contain internal teeth cut diagonally through them, and may therefore be regarded as internal " skew " gear-wheels. The teeth are in mesh with corresponding teeth upon a sliding rack, E, which can be moved inwards and outwards along the shaft and slide in a large key-way cut in it. The action of the rack on the discs, C, is to cause them to rotate relatively to the shaft, A, as the racks are moved longitudinally.



FIGS. 2 and 3.—Views of the Simplex Gear. The Chain is entirely absent in Fig 2, and is partly removed in Fig. 3.

Several equi-distant pins, D^1, pass across between guide blocks, D^2, Fig. 5, which ride in opposite slots, B^1, in the discs, B, and the ends of which, D^3, rest in the spiral paths, C^2, of the outer discs, C. In just the same way that the jaws of a scroll-clutch are caused to move inwards and outwards from the centre, so the pins, D^1, travel inwards and outwards in the slots, B^1, when the discs, C, are caused to rotate by the sliding rack, E. The pins, D^1, are all arranged at equal distances from the centre, and they each carry a small sprocket wheel, D. The sprocket wheels can, therefore, be caused to move inwards and outwards towards or away from the centre whilst the shaft is revolving, and since the chain engages with the outer teeth of these sprockets the effective diameter of the skeleton pulley formed by them can be varied over a wide range.

Referring to Fig. 4, and assuming that the first-motion shaft, A, is rotating left-handedly, it will be noticed that the sprockets, D, tend to revolve right-handedly, owing to their pull upon the top side of the chain. They are, however, prevented from revolving about their own centres in *this* direction by a free-wheel clutch of the roller type which is introduced between them and the pins, D^1. The power is therefore transmitted from the shaft, A, to the chain, and it, in turn, tends to rotate the sprockets, D, on the other pulley in a left-handed direction. This pulley on the second-motion shaft, A^1, is similarly constructed, but its sprockets are prevented from rotating *left*-handedly by their free-wheel clutches; the pull of the chain upon them causes their pulley to revolve, and thus the power is transmitted to the second-motion shaft, A^1. The free-wheel clutches may be said to constitute the essence of the invention, for without them it would be impossible to expand and contract the pulleys. As it is, however, they are free to revolve in the opposite directions to those in which the drive tends to turn them, and, consequently, they do so when the pulley is being expanded or contracted, thus remaining in mesh with the chain and yet allowing the length of chain between each of them to be lengthened or shortened as the case may be. By this ingenious arrangement a positive drive is secured, and except when the effective diameter of the pulleys is actually being varied, the free-wheel clutches on all the sprockets which are in mesh with the chain are taking their share of the work, provided that they are so constructed as to have no back-lash in themselves. It will be noticed, however, that when varying the gear-ratio the drive is only transmitted through one clutch at a time.

In the gear which has been made, seven sprockets are arranged in each wheel, and in order to make the chain take as circular a path as possible under all conditions, seven cross-pieces, H (Figs. 2 and 3), are also fitted midway between the sprockets, so that they also slide in and out readily at the same time. These cross-pieces are operated in exactly the same way as the pins, D^1, and the chain rests against them, as well as upon the sprockets. Small steel rollers are to be substituted for these solid cross-pieces in the future, because there is a sliding motion between them and the chain whenever the pulleys are being expanded or contracted.

The two racks, E, are shown with teeth cut in opposite directions in Fig. 6, which is a plan of the complete gear, and the spiral paths in the two pulleys are identical. In the actual machine, however, similar handed racks are employed, and the spiral paths are cut in opposite directions instead. The result, however, is the same in both cases, so that when the racks are forced inwards, the pulley on the first-motion shaft is caused to expand, and that on the second-motion shaft to contract to the same extent.

The racks are simultaneously caused to slide along the large keyways in the shafts by the feed screw, G, and the travelling yoke, G^1, which is moved inwards and outwards by it. Ball-thrust bearings, G^2, which ride on the shafts, A and A^1, serve to connect the ends of the yoke with the racks, and the unequal pressure on the two ends of the yoke, caused by the difference of pressure required by the two racks, is allowed for by a guide beneath the feed screw. In Fig. 1 a handle, G^3, is shown for varying the gear, and in this model each of the pulleys can be varied in a ratio of two to one, giving a total range of gear of four to one, the second-motion shaft revolving at either half or at double the speed of the first-motion shaft.

The tightness of the chain, F, can be adjusted by sliding the bearings of the second-motion shaft horizontally; the tightening screws, J, are fitted for this purpose. Plain bearings are used for both shafts, and the racks, E, can slide freely through them because the shafts at these points are fitted with sleeves, the outside faces of which provide the bearing surfaces and which are of sufficient size to bridge over the teeth of the racks.

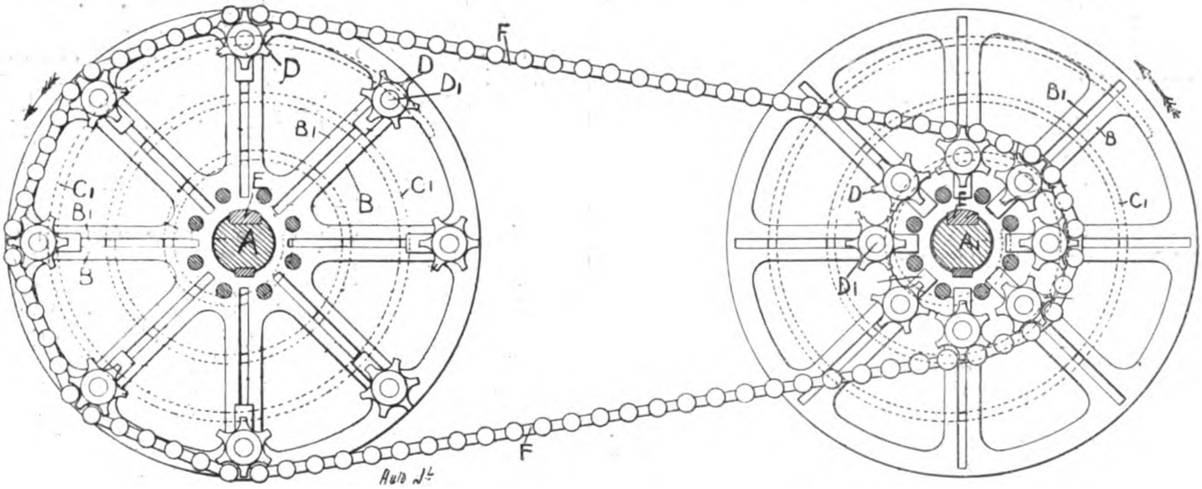


Fig. 4.—Side View of Driving and Driven Wheels, with their Connecting Chain and Adjustable Sprockets.

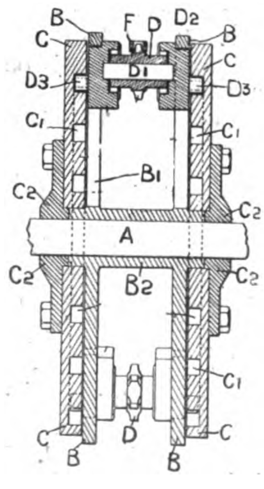


Fig. 5.—Transverse Section through one of the Expanding Wheels, one Sprocket in Section and one in Elevation.

The existing mechanism is fitted so that the pulleys and the connecting chain run in an oil bath; it is intended to transmit 10-h.p. with the first-motion shaft running at a speed of 400 revs. per min. The speed of the second-motion shaft can then be varied from 200 to 800 revs. per min., and the variations over the entire range is calculated to be performed in actual practice in a minimum time of about 30 secs. In the new models which are now being completed, we understand that a lighter construction throughout is being adopted, and that two 6-h.p. gear, and one for a 16-h.p. car, are in hand. These smaller ones are to have five, instead of seven, sprockets, and although the variations of speed provided for in them will be the same, the two pulleys will be of smaller diameter. In the experimental model, the distance between the two shafts is fifteen inches. One of the 6-h.p. gears is being fitted to a motor car, and the other is to be employed for driving a machine tool, the idea in both cases being to give them an exhaustive trial under severe working conditions in their most important fields of usefulness. It is difficult to foretell the future of this invention, or how far the apparatus will prove successful for automobile work. There are many points to be considered before arriving at any conclusion, and the precise effects produced on the various parts when the machine is in operation are by no means easy to follow. Concerning the chain, however, it is important to notice that although its tightness varies both according to the size of the pulleys and continually as they revolve, yet these variations are comparatively slight, and those due to the sprockets being at intervals only around the pulleys are prevented from setting up any serious vibration owing to the employment of the cross-rollers between the sprockets.

Another point, which at first sight, strikes one is that there is a risk of the chain failing to come in proper mesh with the sprocket with which it is about to engage, and that although the chances are small, it is possible for the point of one tooth to meet one of the rollers of the chain in such a way as to prevent them coming together properly. We are inclined to think, however, that this is a contingency which can be entirely obviated by the employment of a suitable form of chain and suitable sized sprockets; this view of the case appears to be borne out in practice, for we are assured that it has so far been found impossible to make the chain foul the sprocket. From the point of view of lubrication, and of providing against heavy wear and tear from undue strain or end-thrusts, we are satisfied that little trouble need be anticipated, although such details as these will naturally require the careful consideration of the manufacturers, and can only be brought to a high degree of perfection gradually.

Concerning its application to motor cars, Mr. Dumaresq intends to construct a 16-h.p. vehicle, fitted with a 4-cylinder engine, which is to be fixed in the usual position in front with its shaft lying longitudinally. The gear is to be placed in much the usual position, with its first and second-motion shafts in the same horizontal plane; intermediate gearing, however, will be introduced between the crank-shaft and the first-motion shaft so as to reduce the relative speed of the latter. By this arrangement the second-motion shaft can be placed at a lower level than the crank-shaft, so that the yoke connecting the sliding racks will pass beneath the crank chamber, and the second-motion shaft can also be made to lie more or less centrally in the car. The connection between the engine and the gear mechanism is to be uninterrupted by any main clutch, and the main clutch itself will be introduced between the second-motion shaft, and a longitudinal-shaft passing to the live rear-axle. Assuming that the first-motion shaft is driven at one-half the speed of the engine, then the speed of the second-motion shaft can be varied from the same speed as that at which the engine is running down to one-fourth of that speed. It is, of course, a pity that the top speed should have to be obtained by first gearing down and then gearing up, but since this is unavoidable with any gear of the expanding pulley type (unless considerable complications are introduced) we would suggest that it might be found possible and advisable to mount the second-motion shaft in line with the crank-shaft, and to then obtain a direct-through-drive on the top speed; these two shafts would have of course to be arranged to run in the same direction as one another. The feasibility of this idea would appear to be strengthened by the fact that the mechanism in any event allows the car to which it is fitted to coast down hills, and that this free-wheel action would prevent any damage from being done in the event of the top gear being brought into play before the variable gearing had brought the speed of the second-motion shaft up to that of the crank-shaft.

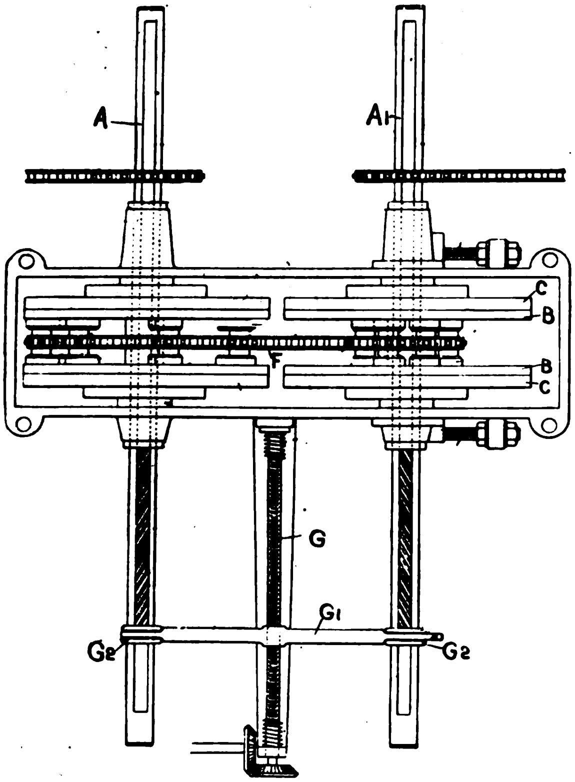


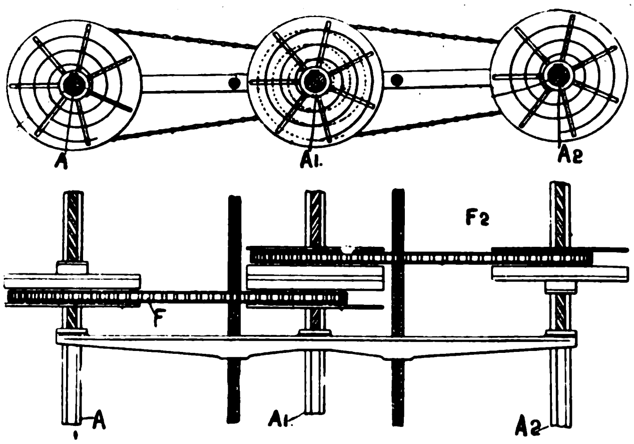
FIG. 6.—Plan of Simplex Gear with lid of gear box removed

Mr. Dumaresq proposes to operate the gear by a small lever on the steering pillar, and to introduce a relay mechanism by which the feed-screw moving the racks is rotated in one direction or the other by the engine itself. For this purpose he mounts a small two-way friction clutch on the first-motion shaft in such a way that the driver causes one or other of them to come into operation, and that the one drives the feed-screw in the one direction and the other in the other direction. He provides means by which it is impossible to feed the racks too far in either direction, and this he does by allowing the yoke to run off the thread at the ends of the feed-screw against compression springs.

The gear does not, of course, provide for reversing, and it is therefore intended to introduce a reversing gear of the epicyclic type, and to make it a part of the main clutch. When travelling forwards this gear will revolve as one piece, and when the main clutch is disengaged the "reverse" is brought into play by the application of a band brake.

Although the application of this mechanism to automobiles concerns us chiefly, yet there are, of course, many other purposes to which it can be usefully applied, if it proves itself to be a practical success. The arrangement shown in Fig. 7 is hardly likely to be needed for an automobile, but is interesting in consequence of the fact that with pulleys having a range of two to one, and mounted on three parallel shafts, the gear ratio between the first, A, and the third, A^2, is 16 to 1. Each of the three shafts has a sliding rack, and the second-motion shaft, A^1, has two inversely operated pulleys mounted upon it. The chain, F, transmits the power from the shaft, A, to the shaft, A^1, and the chain, F^2, conveys it from A^2, to A^3. This device is seen both in elevation and in plan.

FIG. 7.—Side Elevation and Plan of Double Reduction Gear.



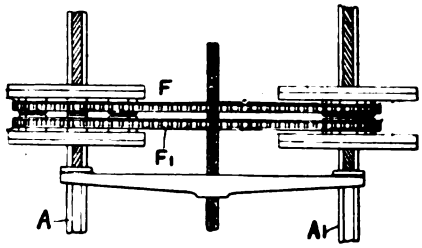


FIG. 8.—Plan of Reversible Simplex Gear.

In Fig. 8, two independent chains, F and F^1, are used for connecting the first pulley with the second, and the sprockets over which they run are mounted side by side upon each of the pins. The two sprockets on each pin, however, have free-wheel clutches which act in opposite directions to one another. By this arrangement the power can be transmitted from one shaft to the other in either direction, and the arrangement is suitable for use in those cases in which a free-wheel action between the two shafts is inadmissible.

The above description will serve to give a good general idea of this interesting invention, and sufficient has been said to lay the most important points concerning it before our readers. Practical experience can alone prove its value to automobilists, and we shall watch with considerable interest its performances when fitted to the cars now under construction. It is being developed by the British Simplex Gear Company, whose temporary offices are at Burden Mews, Kensington, W., and who hope to put it on the market at no very distant date.

THE LATEST MORS APPARATUS FOR TIMING CARS.

THE Mors timing apparatus, which gained the first prize in the A. C. F. competition is illustrated in the accompanying figure. It was designed for the company by M. Potier, and consists essentially of a Morse apparatus arranged to unroll a strip of paper in the usual way, combined with electro-magnetic punches and a chronometer. The general arrangement of the appliance is shown in Fig. 1. The chronometer is arranged so as to close the electric circuit through an electro-magnet punching holes in the strip of paper at every fifth of a second. A second similar arrangement is connected with a bell push, which is held in the hand by a timekeeper. When the car is about to start the apparatus is set in action, paper band is unrolled, and the chronometer makes upon it a series of punches at every fifth of a second. When the car passes the starting point the timekeeper presses the push, and the electro-magnet in connection with it produces a punch in the side of the paper. Fig. 2 shows a short length of the paper on which the central row of the series of punchings made by the chronometer represent fifths of seconds (the complete seconds being indicated by additional punchings above the central row), the point at which the car started, and at which the bell-push was pressed, is shown by the punching towards the bottom of the strip. It will be understood that the points of the three punches are in a straight line with one another across the strip of paper. When the car reaches the end of the course over which its time is to be taken, another observer stationed at that point presses a second bell-push arranged in parallel with the first, and this makes a second punching on the paper in the same way as the first was made, and so enables, by comparison with the other two rows of punchings, the exact time taken by the car to be ascertained. By multiplying the number of observers provided with push contacts similarly connected to the apparatus, and stationing them at a kilometre or mile apart, the speed records for the kilometre or mile, or any number of miles or kilometres, with or without a flying start, can be ascertained. Special apparatus is designed by the Company for accurately estimating the time elapsing between any of the regular marks on the paper and that at which the punching corresponding to the passage of the car over a given point is registered, and it is claimed that this can be done up to a one-thousandth of a second. As, however, the equation of personal error of each observer is likely to vary enormously more than this, this part of the invention appears to us a rather unnecessary refinement, and we have not illustrated the apparatus employed for the purpose. To some extent the present apparatus of the Mors Company appears to be a retrogression upon the earlier form, as it involves the personal equation of observers; the earlier apparatus, it will be remembered, having depended upon the contact of the car with a wire or cord stretched across the course. In order to get really accurate results it would appear that some such arrangement is necessary, as the personal lag of observers is found in such cases to vary, generally from a tenth to a fifth of a second.

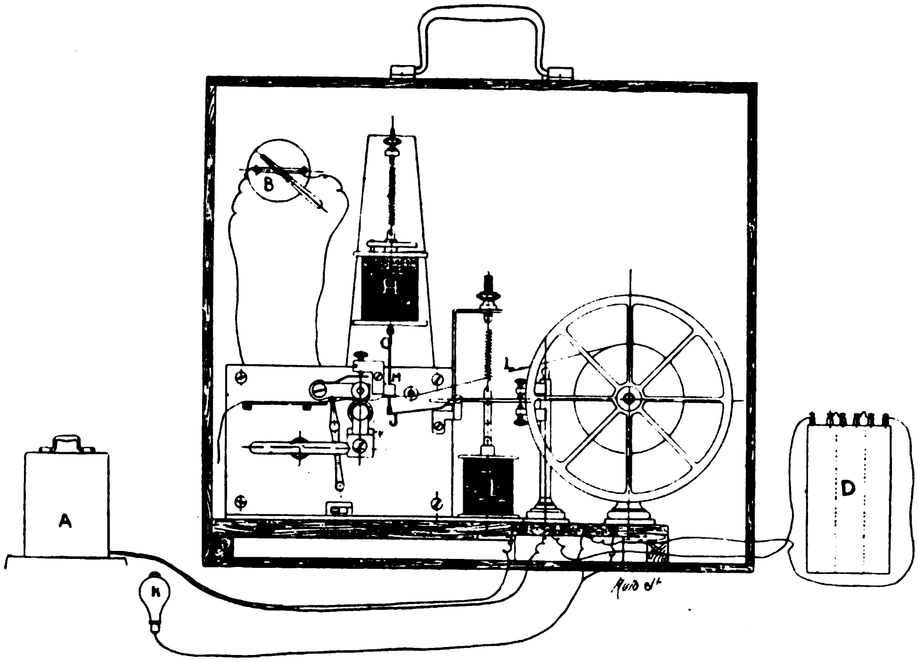


FIG. 1.—Mors Timing Apparatus.

A, chronometer. B, switch for starting the paper feed. D, battery for energising electro-magnets. L, paper strip passing to punches, M and J. H, electro-magnet operating punch, M, for marking fifths of seconds. K, bell-push connected with electro-magnet, I, for making the punchings (by operating the lever, J,) corresponding to passage of car in front of time-keeper.

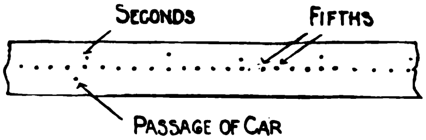


FIG. 2.—Specimen of Mors record

WHY ELECTRIC MOTORS SOMETIMES GET HOT.

THE electric motor becomes daily of greater importance in the automobile industry, not only on account of the more general distribution of the electric car pure and simple, but also owing to the introduction of mixed methods of driving on what may be called the Lohne-Porsche-Mercedes and the Fischer systems in which a petrol motor is employed to drive a dynamo, and the dynamo supplies current to the motors which propel the car.

It might be assumed at the present day that difficulties of armature heating both in dynamos and motors were entirely overcome, and this is undoubtedly the case with the larger types of stationary machines. The problem cannot, unfortunately, be considered so universally solved in the case of small dynamos and motors of the dimensions usually employed for vehicle propulsion. Those who have practical experience of these classes of machine will know only too well how very frequently abnormal armature heating is encountered. The peculiarity is that the heating is by no means greatest on full load. On the contrary, it is often most excessive on light load, and even (in the case of dynamos) on open circuit. The subject was dealt with in a suggestive article by Mr. F. W. Davis some little time ago in our contemporary the *Electrician*. His observations confirm the above remarks, and go to show that the evil has a tendency to be greater in the case of four-pole and multipolar machines. As the majority of motors employed in car propulsion are four-polar, and as the tendency is to adopt multipolar designs in the case of dynamos coupled to petrol engines on cars, this aspect of the question is of considerable importance to the car builder. The tendency to multipolar construction in the case of dynamos employed in vehicles like the Fischer omnibus, is, of course, due to the fact that, for a dynamo, they have to run at slow speed, and that the necessary voltage is more conveniently obtained at such speed in the case of a two-pole machine.

Mr. Davies points out that there are three principal sources of heating in the armatures—the C^2R loss, the hysteresis loss, and the loss due to eddy currents in the core stampings.

The first of these in any well-designed motor or dynamo are, of course, negligible. The second is proportional to the number of cycles through which the iron of the armature is forced per second, and this, of course, is greater in the case of a four-pole than in that of a two-pole machine, and greater in the case of a six-pole machine than in that of a four. Where, therefore, the proportions of iron in the active portion of the armature (what Professor S. P. Thompson at the British Association lately termed "the active belt") are approximately the same in the case of a four-pole motor or dynamo as would be suitable in a two-pole machine, heating is almost certain to result, and this heating will be practically independent of the amount of current the machine is giving. In fact it will be as great with very small currents and on open circuit as at full load. This mistake in design is by no means uncommon, and explains the curious results occasionally observed.

The heating due to eddy currents in the armature core is another frequent source of heating, though it is a less excusable one. It should not occur at all, and where it is met with is due to imperfect insulation between the armature laminal. Where these are inadequately insulated eddy currents will, of course, be formed, and when they are formed the heating due to them will be directly proportional to the speed, and to the number of poles the machine possesses.

In addition to the above causes of heating, Mr. Davis points out that in a four-pole machine the angle embraced by the poles is always rather less than double that embraced in the two-pole machines. This, of course, means that to get the same result the magnetic intensity must be correspondingly greater, and this will again give rise to increased heating owing to the above causes.

As we pointed out at first, the subject is an important one for the automobile industry, owing to the increased employment of small multipolar dynamos and motors. Builders of these classes of machines, therefore, would do well to bear in mind the above considerations, small dynamos and motors having by no means invariably proved themselves all that could be desired.

* * *

THE Weston Motor Syndicate, of 44, Mortimer Street, W., have issued a neatly got up descriptive catalogue of their Chenard and Walcker cars, a full description of which appeared recently in our columns.

EVER since wireless telegraphy assumed a commercial aspect we have been hearing of inventors who have devised a method not only of transmitting signals but also energy by means of Hertzian waves. The latest instance of this kind of thing has been provided by the *Westminster Gazette*. Mr. T. H. Williams proposes to have electric cars with one terminal earthed, and to send energy to them from something like a Marconi transmitting station, the energy presumably being concentrated by a reflector on the car. The periodicity of the electric undulations received by the car is to be diminished to a practicable figure, and then the car is to run, presumably, by means of an alternating current motor. It is very funny to find a serious paper being "spoofed" (there is no other name for it) in this ridiculous way. Imagine a station sending out energy on such a stupendous scale that the fraction of it which a car can catch at a distance of miles would be sufficient to provide for the propulsion of the car.

THE old chestnut of a motor car for the working-man ripens from time to time with perennial freshness. Some genius has written to the *English Mechanic* describing how he built a complete car with 4½-h.p. De Dion motor for £17 including the body. He is stated to run about on it at 25 to 30 miles an hour. We do not know what his repair bill is and whether any fees have yet been paid to an undertaker for including the body, but we have our fears. And an almost equally terrible invention is attributed to a French engineer It is called a "criterium," and consists of an aluminium box (these things are usually made of aluminium) containing a Geneva watch, a chronograph, and mileage counters. The combination of these articles in the aluminium box, it is said, enables the driver to ascertain the speed of the vehicle he is driving, how much fuel he uses, what distance he has run, and the exact time he took in running it. This is all the inventor claims at present. Probably he will soon improve his device so as to indicate the proper road to take at corners, to repair tyres and grind in valves. It will then be quite a valuable piece of apparatus.

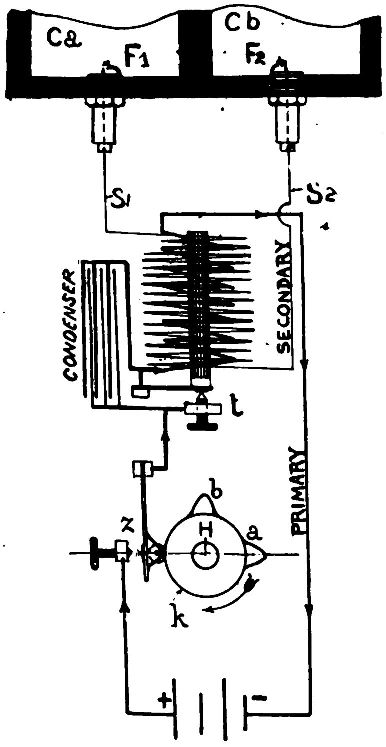
SYNCHRONISING THE SPARK IN MULTI-CYLINDER PETROL MOTORS.

WE have already referred to the difficulty of securing absolute synchronism of the operations forming the cycle in each cylinder in multi-cylinder petrol engines, and have pointed out that 4-cylinder motors generally fail for this reason to give double the horse power of those fitted with one pair only of the same size. Care in design and accuracy of workmanship can ensure synchronism in many respects, but there are certain contingencies which mechanical consruction alone cannot guard against. A want of synchronism mtay arise from differences in the capacities of the combustion chambers from leaking pistons or valves, from variations in the length of the induction pipe between the carburettor and each cylinder, or from varying resistances to the escape of the exhaust gases from the cylinders, and these are the causes which are avoidable by careful manufacture. The chief source of trouble, however, has hitherto resulted from the electric ignition systems employed, and the difficulty which is experienced in tuning two or more coils, their tremblers, and their contact breakers, so as to bring them into unison with one another.

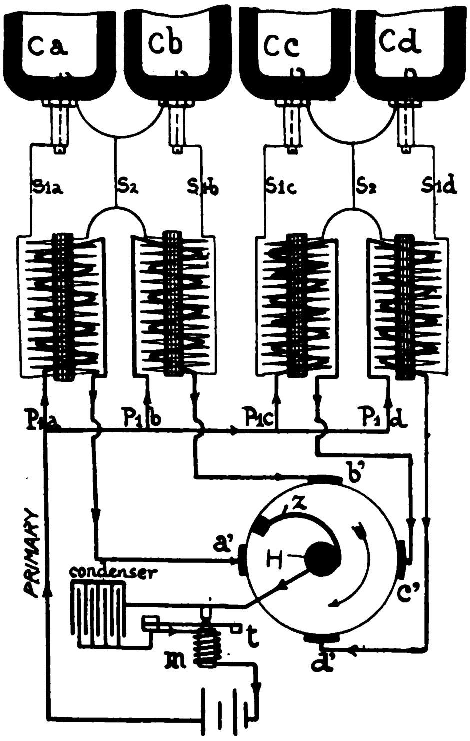
Three different systems have recently been described by us, in which the electric ignition apparatus has been modified in such a way as to reduce this risk, and it is interesting to notice that in all these, one vibrating trembler only is employed. The three systems referred to are those of Chenard and Walcker, Wilson and Pilcher, and F. C. Blake. These are diagrammatically shown side by side in the accompanying illustration, and the products of these manufacturers have been already dealt with by us in Vol. VIII., pp. 105-107, and pp. 154-157; Vol. V., pp. 449-451; Vol. VII., pp. 579 and 580; Vol. VIII., pp. 109-112; Vol. VII., pp. 152-154, and Vol. VIII., p. 199, respectively.

In the first of these, one coil, one condenser, and one trembler serve for two cylinders; in the second, four coils, one condenser and one trembler are used for four cylinders; and in the third, a single coil, with its trembler and condenser, are sufficient for four cylinders. In order to realise the differences between either of these arrangements and that generally found in use upon the majority of vehicles, it should be borne in mind that, as a rule, one coil, one trembler, and one condenser are necessary for each cylinder.

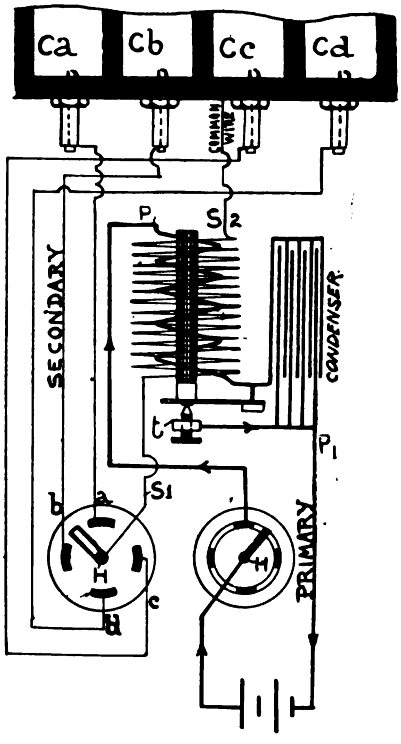
The reason why a multiplicity of tremblers is objectionable, is that each one is liable to have its own particular lag, and its own particular speed of vibration, and that since the moment and intensity of the spark depends upon its movement, the relative time at which the explosions occur may differ materially.



The Chenard and Walcker System.



The Wilson and Pilcher System



The Blake System.

It will also be seen that in all three systems the commutator is so designed that synchronism is ensured so far as they are concerned, and that ordinary wear and tear does not affect it. In many ordinary commutators, in which one cam operates two or more contact springs successively, it is almost impossible for the contact points against which the springs are pressed to remain in correct adjustment relatively to one another, apart altogether from the consideration that the contact surfaces of some may be cleaner than those of others. In the three systems which we illustrate the commutators are so designed that careful machining is all that is required to enable absolute accuracy to be attained.

Referring to the diagrams, the cylinders are represented by C*a*, C*b*, &c., the commutator spindles by the letter H, the tremblers by the letter *t*, and the high-tension wires from the coils by the letters S^1 and S^2.

In the Chenard and Walcker scheme a single induction-coil of ordinary construction, fitted with its own trembler, has its two secondary terminals, S^1 and S^2, connected to the insulated portions of the two plugs, F^1 and F^2, respectively. The current from the battery is led through a "making-and-breaking" device, Z, in the commutator which is operated by the two projections, *a* and *b*, on the cam, *k*. The primary circuit is thus completed when a spark is required in either cylinder, and since the current flows from plug to plug through the cylinder casting both sparks occur simultaneously, although only one at a time is really required. In this system, synchronism depends upon the proper construction of the cam, *k*, and its projections, *a* and *b*; any lag which may be introduced by the coil, its trembler, or the contact-maker, *k*, being common to both cylinders.

In the Wilson and Pilcher arrangement, the primary windings of the four coils are alternately connected with the battery through an independently operated trembler, which is worked by a small electro-magnet, and is provided with a condenser. The commutator was illustrated by us in our issue of September 27th, 1902, p. 579, and is represented diagrammatically in the drawing, where H is its half-speed shaft, Z the revolving contact spring, and *a*, *b*, *c*, and *d* are the four stationary contact blocks against which Z presses. Separate wires lead from each of these contact blocks to one end of the primaries of the respective coils, and the wire from the other terminal of the battery branches to the other ends, P1*a*, P1*b*, P1*c*, and P1*d*, of the primary coils. The high tension connections from the coils to the plugs are arranged in the usual manner, S1*a*, S1*b*, S1*c*, and S1*d*, being the insulated terminals, and S^2 the earthed wires. In this system, synchronism depends entirely upon the similarity of the four coils and upon the proper construction of the commutator, both of which requirements are easy to obtain in practice.

In the Blake system, which is less of a new departure from previous practices, an ordinary coil, with its trembler and condenser is used, and the commutator automatically connects the battery with its primary terminals, P and P^1, each time that the spark is required in any of the cylinders. The commutator spindle, H, also drives a high tension switch connection, which alternately puts the insulated secondary terminal, S^1, in electrical communication with the four ignition plugs, through the contact blocks A, B, C and D, before the primary circuit is completed, and does not interrupt them till after the primary connections are broken. The secondary wire, S^2, is earthed as usual.

These various methods of obtaining better synchronism in multicylinder engines cannot fail to have an interest for many of our readers. It is such improvements as these which tend to increase the field of usefulness of petrol cars.

AN excellent catalogue is to hand from the Hozier Engineering Company, Limited, of Glasgow, the makers of the well-known Argyll motor cars and delivery vans. The get-up is very effective, and the plan adopted throughout of showing the various parts lettered, accompanied by a clear and exhaustive description, renders the publication of considerable value to owners of these cars. The "Hints to Users" towards the end of the catalogue contains some valuable practical suggestions, which have the merit of being applicable to every type of motor vehicle. Both the letterpress and the illustrations are specimens of high-class printing, the whole being enclosed in an attractive and artistic cover.

FIRE ENGINES—A COMPARISON.

TOWARDS the end of 1901, the Hanover municipal authorities, wishing to make a comparison of rapidity, efficiency, and cost between horse-drawn fire-engines and automobiles, made the following purchases:—

1. Three horse-drawn hand fire-engines, at a total cost of 46,500 marks.

2. One fire-engine, with gas motor for working the pumps, propelled electrically, costing 15,300 marks without accessories, weighing empty 2,492 kilogs., and with full load 4,589 kilogs. The battery of this machine weighs 1,110 kilogs.; water, 400 kilogs.; accessories, 213 kilogs.; five men, 374 kilogs. The useful load is, therefore, 1,200 kilogs. The electric motor propels the vehicle at a nominal speed of 16 kiloms. per hour, consuming 0·8 kilowatt hours per kilometre at 6·61 ampères at 121 volts. The accumulators carry a sufficient charge for 25 kiloms., and are charged at 121 volts, the time of charging being estimated at 6½ minutes per kilometre with a current of 45 ampères.

3. An electric reservoir carriage, at a cost of 10,600 marks, without accessories, weighing empty 2,283 kilogs., and with full load 4,588 kilogs., having a speed radius of action greater than the preceding one.

4. A steam fire engine for the price of 16,500 marks, without accessories, weighing empty 3,440 kilogs., with full load 4,525 kilogs., water, alcohol, coal, 476 kilogs., outfit 130 kilogs., 6 men 479 kilogs., having a speed of 20 kiloms. an hour, and a delivery of 1,000 litres per minute. The boiler carries a gauge marked up 150 lbs., and has a heating surface of 5,629 square metres, with a fire bar surface of 0·38 square metres. The pump mechanism is immediately behind the front seat, and consists of two double-acting cylinders. The two cylinders of 10-h.p. are placed between the pump and the boiler, which is mounted between the driving wheels. The steering gear and regulator are in front within reach of the driver. The boiler is kept constantly under steam, by means of a gas ring, at the fire station. As soon as an alarm is given the engine is started by liquid carbonic acid, and the fire is lighted *en route* with briquettes saturated with alcohol. The firing is afterwards done by coal or coke.

The boiler is fed with rain water only.

These three carriages are noiseless, odourless, and smokeless, and the wheels are rubber-tyred. The manufacturers of the tyres have guaranteed them to run a distance of 10,000 kiloms., which, as a fire engine in Hanover averages 2,000 kiloms. per annum, is equivalent to a guarantee for five years. The electric batteries have required no change, and it is only by an extended trial that their durability can be tested. Coal, alcohol, oil, or electric current for the two electric engines have cost 930 marks, for the steamer 1,080 marks, or 2,000 marks in round figures.

The comparison has been made both as regards the purchase price, and also as to the cost of working. The three automobiles cost 42,400 marks, with 12,600 marks for accessories, or 55,000 marks, while the price of the horse-drawn manuals was 46,500 marks, showing a balance in favour of the latter of 8,500 marks.

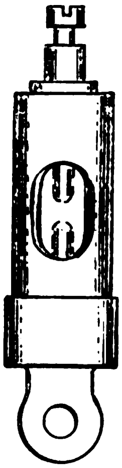
The expenses of working and of the necessary staff for the whole year were for the automobiles 25,000 marks, including 2,000 marks for fuel and electric current; the hand pumps, on the other hand, have necessitated an expenditure of 36,500 marks, or a difference of 11,500 marks in favour of pumps with mechanical traction.

The result of the trial, therefore, shows, that taking the first cost and expenses together, the horse-drawn manuals have cost 3,000 marks more than the automobile engines. It will thus be seen that in five years the saving in working expenses will cover the purchase price of the automobiles with their accessories, and still leave a balance of 2,500 marks in their favour.

The city of Hanover is very favourable for automobilism; the roads are excellent, and the few gradients that are met with never exceed 2 per cent.

AN ENCLOSED SPARK-GAP FOR PETROL AUTOMOTORS.

THE accompanying illustration represents a spark-gap apparatus intended for use in connection with high-tension electric ignition systems. We have already referred to the advantages which attend the employment of an external spark-gap in series with an ignition plug, and have explained the reason why the action of the plug is less liable to be upset by the formation of carbon across its porcelain in the cylinder. This instrument consists of a spark-gap device which is enclosed in a glass tube, so that it can be used on a tricycle, or on other automobiles where it is liable to be exposed to the elements. Another advantage attending the employment of spark-gaps of this kind is that they enable the driver to see at a glance whether the electrical apparatus other than the plug is working properly or not. The instrument has been put on the market by Messrs. C. S. Rolls and Co., of Lillie Hall, Earl's Court, where they will be glad to demonstrate its advantages to anyone wishing to inspect it.



Spark-gap apparatus for petrol engines.

PROFESSOR HELE-SHAW, upon the occasion of his opening speech in connection with the Liverpool Cycle and Motor Show which was held recently, during an extremely interesting discourse was very emphatic upon a point which we have times out of number insisted upon as a *sine qua non* for owners of automobiles who desire to get the best out of their machines, whether they be motor bicycles, voiturettes, or giant cars. Professor Hele-Shaw said that if a man had not prepared himself to thoroughly master the details of the working of his car, he must take care that he has a proper attendant who was not a mere driver, but a skilled mechanic. He maintained that it was from overlooking this fact that nine-tenths of the disappointments in motoring were experienced, whilst on the other hand everyone who had really taken the matter up seriously, and given the working of the motor car the attention it deserved, had been amply repaid, not merely in the pleasure which the motor car gave from the sense of freedom and independence which being able to travel anywhere on the roads ensured, but from the point of view of being able to move rapidly from place to place, starting the motor by the mere turning of a handle, which, if it was in proper order and properly cared for, might be trusted to go any distance without fatigue in all weathers, and to continue doing so if necessary twenty-four hours in the day.

THE AUTOMOBILE CLUB.

THE Annual General Meeting of the Automobile Club and the Automobile Proprietary (Limited), was held last Friday, when the accounts and budget for the year were passed as presented. The present income of the Club is £13,000 per annum, showing a most extraordinary advance on its income a few years back—£332—and indicating the remarkable advances which are being made in the automobile industry. The fact that the King had consented to become the Patron of the Club was announced, at the commencement of the meeting, by the Chairman, Mr. Roger Wallace, who also stated that a Ladies' Automobile Club was in course of organisation, to work in harmony with the Automobile Club, the supervision of the preliminary arrangements having been undertaken by Lady Cecil Scott Montagu.

The New Committee was appointed, the following gentlemen being elected:—

Messrs. W. Worby Beaumont, M.I.C.E., Alfred F. Bird, Professor C. Vernon Boys, F.R.S., Messrs. T. B. Browne, Frank H. Butler, R. W. Buttemer, E. R. Calthrop, M.I.C.E., Captain Kenneth R. Campbell, D.S.O., Messrs. George Cornwallis-West, E. H. Cozens-Hardy, A.M.I.E.E., J. S. Critchley, M.I.M.E., Colonel R. E. B. Crompton, C.B., Messrs. S. F. Edge, Henry Edmunds, M.I.C.E., T. W. Staplee Firth, W. G. D. Goff (Chairman of the Irish A.C.), J. M. Gorham, M.I.C.E., Professor H. S. Hele-Shaw, LL.D., F.R.S., Lieut.-Colonel H. C. L. Holden, R.A., F.R.S., Messrs. H. E. Sherwin Holt, J. Ernest Hutton, C. Jarrott, W. J. Leonard, Major F. Lindsay Lloyd, R.E., Messrs. Edmund Macrory, K.C., Edward Manville, M.I.E.E., Mark Mayhew, L.C.C., Hon. John Scott Montagu, M.P., Messrs. George Montagu, M.P., Henry Norman, M.P., R. E. Phillips, M.I.M.E., A.M.I.C.E., E. K. Purchase, Dr. Boverton Redwood, D.Sc., F.R.S.E., Hon. C. S. Rolls, Messrs. Lionel de Rothschild, W. E. Rowcliffe (Manchester A.C.), The Master of Ruthven, D.S.O., Sir David Salomons, Bart., Messrs. J. Lyons Sampson, E. R. Shipton, J. D. Siddeley (Chairman of the Midland A.C.), Paris E. Singer, E. Shrapnell Smith, Stanley Spooner, Hon. Arthur Stanley, M.P., Mr. Henry Sturmey, Sir John I. Thornycroft, F.R.S., Messrs. Roger W. Wallace, K.C., Hugh Weguelin, A. F. Yarrow, M.I.C.E.

The Testimonial to Mr. Johnson, the retiring Secretary, was formally announced, the list being headed with 100 guineas by the Automobile Club. Mr. Johnson, in speaking, deprecated the suggestion of the Testimonial to himself, rather urging that all efforts should be concentrated upon obtaining all the financial assistance possible to make the Gordon-Bennett Race a huge success. Referring to the efforts of the Club to bring about the running of the Gordon-Bennett Race in Great Britain, he said, as far back as July 22nd the first step was taken in the form of a letter written by himself, in which enquiries were made in Ireland in regard to a suitable locality, and the methods to be adopted in bringing about the much-desired permission.

On Monday last Mr. Roger W. Wallace was again elected Chairman for 1903, Hon. J. Scott Montagu, M.P., Mr. Mark Mayhew, and Col. R. E. B. Crompton, C.B., Vice-Presidents, and Sir David Salomons, Chairman of the Foreign Relations Committee.

THE first ordinary general meeting of the Aëro Proprietary, Limited, will be held on Tuesday next, the 10th of March.

THE Easter Motor Cycle Tour of the Cyclists' Touring Club will be of five days' duration, starting on April 9th, the daily runs being to Salisbury, to Exeter (*viâ* Dorchester or Shaftesbury), to Bristol, to Worcester, and back to London, a total distance of about 400 miles.

THE GORDON-BENNETT RACE.

MR. SCOTT MONTAGU'S Bill for enabling the Gordon-Bennett Race to be held in Ireland was read a third time, amid acclamation, on Monday last. That the race will be held in Ireland may, therefore, now be looked upon as a moral certainty, the chances of opposition to the Bill in the House of Lords being practically negligible. We are glad the third reading of the Bill was accompanied by applause. It is justly an occasion for congratulation and jubilation, and everybody is naturally anxious to take credit for having conduced to this highly satisfactory result. Some of our contemporaries take particular credit to themselves. We think we may reasonably claim to have from the very first pointed out the right course to pursue, the course which has been successfully adopted. This course was, in fact, the only one which could have led to a satisfactory result, and has been the course actually adopted from the first by the Automobile Club. When the race was won by Mr. Edge last year the Press generally—and the automobile Press was no exception—commenced by assuming that there was no possibility of holding the race in this country. This was followed by a considerable amount of wild talk about enabling the race to be run in Ireland by proclamation by the Lord Lieutenant or arrangement with the police authorities. Not till we had repeatedly insisted on the absolute necessity of an enabling Act, such as that which has just been read a third time, did the Press generally come into line with ourselves in advocating it. The race was finished on June 28th. In our next issue (published on July 3rd) we wrote as follows when dealing with the results which would follow Mr. Edge's triumph, in view of the fact that the then existing law formed a barrier to the race being run in the British Isles :—

> "There is only one method by which such a race could be rendered legal in this country. . . . If the Gordon-Bennett Race is to be run next year in this country a short Act of Parliament will have to be passed providing for the legalisation of the event on a particular day. It might be quite non-contentious. Is there any chance of getting such an Act passed? It would appeal to the sporting instincts of a large number of members of Parliament and the whole nation. It would impart a valuable impulse to an important national industry. It would go a long way to abolish the prejudices which still hamper the automobile movement by interesting extensive classes of the community in a national event, and as the Act need only refer to this one particular occasion it could do nobody any real harm. It is worth agitating for."

The Press generally, however, persisted in ignoring the necessity for legislation, and the project of passing the Bill and of holding the race in the British Islands was regarded very platonically. In our next issue we declared :—

> "The Press generally does not appear to realise what a splendid opportunity for British automobilism Mr. Edge's success provides. The general attitude appears to be that to hold the race here is not to be thought of, that of course it will be held somewhere else, presumably, as the regulations direct, in France, in which country the race must be run if the authorities will not permit it to be held in the country which is in possession of the Cup for the time being. We protest against this attitude. Its general adoption means that a golden opportunity of widely extending the interest in automobilism in this country will be wasted. . . . To witness an event of the kind and to have brought home to one considerations of this nature, have an educational effect on a large number of people, and necessarily in consequence, as already pointed out, increases the general interest in and comprehension of the automobile. It is for these reasons that in our last number we suggested the passage of a short Act to legalise the holding of the race next year. For the passage of such an Act we intend to agitate, and will do our best to stimulate others to do the same. The object is worth fighting for."

Misconceptions, however, still continued, and suggestions were made that the local police authorities might be instructed to take no action. We pointed out the futility of these proposals on July 19th and July 26th as follows :—

> "We don't want to dodge the law, we want to alter it. If we succeed in doing that we provide tangible evidence of the power and importance of the industry which will have an incalculable effect in overcoming the prejudice, and curbing, if not abating, the hostility by which the movement is at present assailed. . . . We refer to these misconceptions, as until they are removed, and until it is recognised that the only way to enable the Gordon-Bennett race to be held in England is to pass an Act for that purpose, widespread and energetic agitation for such an Act will not arise. These mistaken views do considerable harm on this account, and it is our first duty to correct them. Once the situation is generally understood, we feel confident that the line we have adopted will command general, and, we trust, enthusiastic support."

These misconceptions were not by any means removed as late as October last, and in our first issue in that month we devoted a lengthy article under the title of "The Gordon-Bennett Race—A National Opportunity," from which we quote the following :—

> "It has been imagined that the Chief Secretary for Ireland and the Lord Lieutenant might be able by proclamation to suspend the law of the land to allow the race to come off in their dominions. We have previously pointed out the chimerical nature of these proposals. They are mere red herrings across the course that ought to be pursued. On a former occasion we have pointed out that the only effective and dignified course is to procure the passage of a short enabling Act. It may be worth while to shortly consider what steps it would be necessary to take to effect this, and the tactics it would be advisable to pursue to ensure it passing."
>
> "In the first place there would probably be much wisdom in selecting one or two routes over which the race could satisfactorily be run. Having settled provisionally on them, a committee of the A.C.G.B.I. might take upon itself to make friends of the Mammon of Unrighteousness along the proposed course. They might point out the fun of the proceedings; the interest of the event; and last but not least, the amount of business to hotel keepers and tradesmen which would be likely to result. Skilful portrayàl of what these events have meant in France, supplemented by diplomatic suggestions that the French ought not to be allowed to have all the amusement of automobile racing to themselves, would probably work wonders, not merely in getting rid of opposition, but of converting it into active support. If the work were well done something like enthusiasm might be evoked in favour of the proposal."

This we submit is exactly and precisely the course which those in charge of the proceedings have followed with the present satisfactory result. Even in quite subsidiary matters our suggestions have been followed with happy results. On January 24th we said —

> "Knowing the country we would again suggest that steps might also be taken to interest the local priesthood in the race. They are good friends to have on one's side, and their local influence is enormous."

And this course was subsequently adopted with the consequence that all the local clergy, from the Bishop of Kildare downwards, have become enthusiastic partisans of the race.

We submit, therefore, that we have taken the right line all along as regards the project of holding the Gordon-Bennett Race in the British Islands. The line we adopted was adopted immediately the race was won by Mr. Edge—whose actual time we were the only British journal to give—and we have stuck to that line ever since. Others of our contemporaries have laid claim, in grandiloquent phraseology, to have engineered the whole business. The quotations with dates we have given above from our former numbers speak for themselves, and require, we venture to think, no further comment.

RECENT DEVELOPMENTS IN THE MODERN AUTOMOBILE.

DIGEST OF A PAPER READ BY A. R. SENNETT, A.M.I.C.E., &c., BEFORE THE AUTOMOBILE CLUB ON FEBRUARY 27TH.

BEING allowed only twenty minutes for the reading of his paper, Mr. Sennett, at the outset, announced that to deal with the evolutions of the modern automobile in so short a time would necessarily confine him within such narrow limits that he would restrict his remarks to the petrol carriage. He reminded his audience of George Robert Stephenson's remark in regard to the evolutions in inanimate mechanism, that "half an engineer's life is spent in undoing that which he ought never to have done." Complexity followed by a process of simplification was the usual procedure, and the modern automobile, he said, had now happily arrived at that state in its evolution when it was shedding the scales of complexity. Unlike the railway locomotive, the automobile had suffered from such things as fads and the influence of fashion. In spite of all this the development had been extremely rapid. In visiting the recent Crystal Palace Exhibition, the progress made was forcibly brought to his mind. Illustrating the extraordinary advance shown in a few years, he instanced the Panhard "sire," built in 1895, which ran from Paris to Bordeaux at the then appalling speed of 14½ miles an hour, shown on Mr. Rolls's stand at the Palace. Also the Peugeot "sire," a wiry-looking vehicle, with bicycle wheels shod with solid rubber tyres and tiller-bar steered, which ran from Paris to Rouen just about the same time, these representing the vertical and the horizontal cylinder *genus*; and thirdly, a jumpy contrivance propelled by a single-cylinder Benz motor, its power transmission being by belting, which ran in the same race. In the internal economy of these three pioneer carriages was comprised all the inanimate organs upon which the whole evolution had been wrought. Dealing with the various parts of the modern motor vehicle, Mr. Sennett first referred to the change-speed gear as being the least satisfactory organ of the automobile, and which had not progressed one iota. The *train balladeur*, supposed to have been invented by the late M. Levassor, was really the invention of James Watt, whose original sketch was still in existence. Even M. Levassor, he said, regarded his change-speed gear as "*brusque et brutal*," but what would you—"*il marche.*" It worked with more or less satisfaction and with a fair degree of reliability. Hence its continuance to the present day. Mr. Sennett felt that this method would in the near future be entirely superseded by the substitution in its place of a simple half-speed, or better still, a low ratio gear in which the epicyclic principle was embodied, and no positive disengagement of teeth resorted to.

In the transmission, evidence of beneficial evolution was noticeable in the advent of the live axle, which had rung the death-knell of side chains. A general transition in wheels from the suspension or spider wheel to the timber-spoked wheel had taken place, which in all probability would prove a lasting one. By the use of internal brakes, the crude and wasteful practice of allowing the weight of the brake straps to lie upon the revolving drums was gradually dying out and being replaced by a more rational arrangement of extraneously supported brake blocks. The "jack-in-the-box" had held its own very largely, although in some cases these bevel "satellites" had been replaced by parallel pinions, with the effect that the side thrust, the principal objection to the use of the bevel differential gear, had been eliminated. The latest form of live axle carriages gave evidence of the advance of simplicity in the most modern vehicles. In the steering gear, he noticed a tendency to embody in its design the principle of arranging that the tread of the wheel should fall upon a vertical line falling through the centre of the articulated joint or gimbal pin. In other words, the articulated axles moved about a centre falling within the hubs of the wheel, a system first put in practice in America and now being adopted in Germany. The framing of automobiles *began* with timber construction, and an almost universal reversion to this mode was now to be found. The majority of the more modern carriages had composite frames consisting of metallic flitch-plates provided with an apology for a flange, produced by setting over the top edge of the medial portion. Not only was the width of flange thus obtained inadequate, but the length of plain flitch-plate left projecting at either end was too great. Having regard to the negligible increase of weight due to the extension of the flange, this should undoubtedly be done. Tubular frame construction, introduced originally by firms who were cycle manufacturers, was being gradually discarded. For weighty vehicles, he thought, hydraulically pressed-up frames produced the best "engineer's job." The most scientific form of frame was the rectangular or "box girder," reinforced by a core of ash. No startling phase of evolution had presented itself in the automobile motor, but the recently introduced mechanically-actuated admission valves were likely to prove serviceable and lasting. The improved principles of cooling were important advances, although in some methods adopted, the imprint of the faddist was detected. Among things to be avoided on motor cars were joints. The up-to-date cooler might be said to be built up of joints. The ideal water cooler should only have two joints, those of the induction and eduction pipes. He emphatically condemned the system of placing the fan behind the motor instead of immediately behind the cooler, as destroying facilities of adjustment and inspection whilst at work. He thought in regard to cooling in the future that the injection of water into the cylinders for the dual purpose of cooling, yet facilitating combustion, had great potentialities. The electric ignition was another very useful and satisfactory transition, since the introduction of which ignition troubles had been considerably reduced, and that commonsense modifications, such as placing the commutators upon the dashboard, more liberal contact surface in them, and suitable means of adjustment for wear in the contact pieces, gave promise of still greater efficacy. He condemned the quality of the material and the workmanship in connection with ignition installations, including the slipshod wiring which was generally employed. By way of contrast he instanced the special cable and the system of wiring by Mr. Crossland Taylor and Mr. Shipp, of the British Insulated and Helsby Cable Company. In Mr. Taylor's cable the core consisted of a central steel wire enclosed within six copper wires, wound upon it to form a seven-stranded core. Upon this core was wound a closed spiral of thicker-tinned copper wire, forming a helical sheathing precisely the same as seen upon the wires of the bass notes of a pianoforte. It was obvious that, in the event of the inner strands being broken by vibration or other cause, the spiral sheathing being extensible, electric continuity was still maintained. Mr. Shipp recommends the employment of a heavy lead sheath outside the cable, so that it may act as a condenser. Mr. Sennett said that equilibrium motors, from an engineering point of view, possessed very pronounced shortcomings. They required a very heavy flywheel, and almost invariably entailed additional complication, by reason of the necessity for supplementary gear, this last consideration telling in favour of multiple cylinders. Multiplication of cylinders reduced their temperature, ensured ease with starting, and paved the way for more efficient silencing. He thought that the actual power obtained from the 8-cylinder motors being tried upon the Continent would not come up to expectation, as in an 8-throw crank, loss of power due to torsional stress and twist was likely to arise. An efficient arrangement would be the employment of four double-acting cylinders. He was, at the present moment, watching the development of a petrol motor with double-acting cylinders, which he thought would be a very efficient arrangement, as it would occupy only the same space as the present single-acting motor, whilst giving twice the number of impulses, and *par suite* twice the horse-power. The present system of mounting vertical cylinder motors upon the suspension springs of pleasure carriages he denounced as unscientific. He maintained that no case had been made out against the horizontal cylinder and hoped that those manufacturers who had entered upon this would adhere to it and not swerve from it through the dictates of mere fashion.

In conclusion, Mr. Sennett expressed the opinion that internal combustion engines ought to be made more flexible in the matter of output, apart from the question of speed. He considered that they should more closely resemble a steam engine, with variable cut-off, and that the mixture should be formed in the cylinders instead of prior to admission. He advocated hotter cylinders and the use of steel in their construction.

MR. WORBY BEAUMONT'S DISCUSSION AT THE SOCIETY OF ENGINEERS.

"THE great question is how is the capacity of the existing principal thoroughfares to be increased, and how are new main thoroughfares to be obtained on anything like a satisfactory principle or design?" It was in this way that Mr. Worby Beaumont summed up the situation with regard to London traffic when opening a discussion at the Society of Engineers at the United Service Institution on Monday night. We are glad to find that Mr. Worby Beaumont takes the view that drastic measures are needed for dealing with the growing evil of congested traffic in our large towns, and that mere improvements in locomotion itself will not effect what is needed.

"The great necessity," he declared, "is for more and wider main thoroughfares. It means, in fact, the Hausmannising of a great part of London, and it means that London must recognise the hard fact that immense sums of money will have to be spent to remedy the evil of past neglect, and it must wake to its duties of to-day to secure the planning of a well considered system of wide and well made thoroughfares into and out of the growing London before building operations make it as costly and, in some respects, impossible, as it is now nearer the centre.

"Improvements in the modes of locomotion will do much, but at the present rate of growth of wheeled traffic, it will do no more than provide for that increase even with great improvement and extension of the chief thoroughfares."

This is going to the root of the matter in the proper spirit. It is necessary to drive home such truths as forcibly as possible. London will have to pay, and pay through the nose, for the want of forethought which has permitted the main approaches to be throttled by speculative builders and tramway companies.

The longer the day of reckoning is put off the heavier the bill will be when it has to be met. It will cost millions now. It will cost hundreds of millions if neglected much longer, but it will have to be done sooner or later, and it had better be done soon than late. Mr. Beaumont had some hard things to say about the trams. Here is one:—"Tramways in streets with great traffic density are the cause of great loss of traffic-carrying power, the cause of blocks as a consequence of the hard and fast line upon which alone they can move. They render nugatory the manœuvring power of ordinary vehicles, and the rails themselves are a most fruitful cause of accident." "They should be only permitted outside towns, and that not unless the roads are 60 feet wide at least."

In fact, Mr. Beaumont's remarks expressed a view of the general situation almost identical with that put forward by the Roads Improvement Association and ourselves. We are glad to be able to hail Mr. Beaumont as an ally.

Motor Cycle Trades Association.—This Association held a second meeting on Wednesday last at Anderton's Hotel. Mr. Perman again took the Chair, and a long discussion followed as to the objects of the Association. Mr. Arnott proposed that the chief object of the Association should be the promotion of one show only for motor cycle trades. Mr. Chandler, however, proposed as an amendment, which was carried, "That the Association be formed with the object of regulating and consolidating the interests of the motor cycle trade by combination for the benefit of its members." The following gentlemen were then elected as a Committee, viz.:—Messrs. Brown, Dring, Goodwin, Citroen, Arnott, Hooydonk, Belcher, Jackson, Garrard, and Batson. Mr. S. J. Sewell, Secretary of the Hire Trades Association, was chosen as secretary.

REVIEWS OF BOOKS.

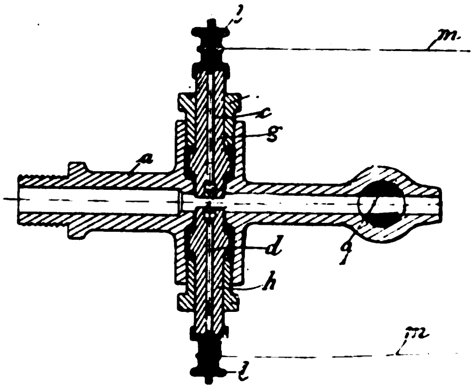
"Penrose's Pictorial Annual; an Illustrated Review of the Graphic Art, being the Process Year-book for 1903," 3*s*. 6*d*. A. W. Penrose and Co., 109, Farringdon Road, London, E.C.

THIS wonderful book is got up in its usual marvellous style. It is one big album of pictures of every kind, reproduced by almost every conceivable photographic process, from architecture to machinery, from the solar spectrum to pictures of country life. Of course the chief beauty of the work are the marvellous reproductions in all varieties of colour process work. These are particularly successful in reproductions of oil paintings, including well-known works by Lord Leighton and other celebrated artists. Not the least interesting amongst these processes is the sample shown of the new spray printing, in which pigments are blown by a sort of miniature sand blast on to the surface of a specially prepared paper, where they adhere and produce the effect of an ultra-impressionist hand painting. The work contains a number of interesting and highly suggestive articles on the various modern processes, of which a few are "Timing Exposures," "Collotype-Autotype," "Direct Three-colour Reproduction by three negatives only," and "Diffraction in Half Tone." If these articles have a fault it is, as in the case of the last one, attempting to be too popular, and rendering the subject sometimes slightly incomprehensible in consequence. When all is said, however, the work remains a marvel of what can be done in modern reproduction. It is a beautiful work for the drawing-room table of anybody, and it is sold for the astoundingly small sum of 3*s*. 6*d*.

THE SIMPSON IGNITION PLUG.

THE accompanying illustration represents, in section, a spark plug which possesses certain features of interest. The chief object which has been aimed at in its design is to enable it to be examined and cleaned without removing it from the cylinder to which it is attached. Another unusual characteristic possessed by it is that both the sparking points are insulated from the engine itself.

The body of the plug, *a*, which screws into the wall of the combustion chamber, is so shaped as to receive the two porcelain plugs, *g* and *h*, opposite to one another and at right angles to itself. The body also projects outwardly some little distance beyond the sparking points, and terminates in the cock, *q*, which, when opened, leaves a clear passage through which an instrument can be introduced for cleaning the spark points. The porcelain plugs, *g* and *h*, contain conducting wires, *c* and *d*, respectively, as in the ordinary ignition plug, but the points of these only project far enough to leave the usual air gap between one point and the other. The porcelains are fixed in place in much the usual way by stuffing boxes, and they are provided at their outer ends with metal terminals, *l*, to receive the wires, *m*. In order to see whether the plug is working properly it is only necessary to open the cock, *q*, and to look down the passage through it—this, of course, being done when the cylinder is not working. If then it is found to require cleaning, the instrument provided for this purpose can be inserted, and any carbon removed from the sparking points.



One of the objects in view—to secure which both the wires are insulated—is that of connecting the two plugs on a two-cylinder motor in series with one another, thus rendering only one coil and contact breaker necessary for the engine. The coil itself, of course, requires to be somewhat larger in order to produce the two sparks in the two cylinders simultaneously, and it is unnecessary to say that only one spark at a time produces any effect in its cylinder, the other occurring at a moment during the cycle in the other cylinder when there is no explosive charge ready to be fired. The simplification of parts, coupled with closer synchronism of the two cylinders with one another, are the advantages aimed at. We are indebted to our contemporary, *La Locomotion Automobile*, for the illustration.

STOCKHOLM will hold its Automobile Exhibition from May 16th to 24th at the Idrottsparken. The show will be under the direct patronage of the Crown Prince of Norway and Sweden.

Laffrey Hill Climb is announced by the Dauphine Automobile Club to take place on July 5th.

Three events for 1903 are announced by the Swiss Automobile Club, viz., a Kilometre Speed Trial in May, an International Race at Neuchatel (Courcelles-la-Tourne), July 5th, and on August 16th a Trelex-Saint-Cergues Road Race.

A week's postponement is announced of the A.C. de France Competition of Silencers, owing to an accident to one of the motors in the Club's laboratory. It will take place on Monday next, the 9th instant, and twelve entries have been received.

Only two entries have been received for the "Coupe D'Arenberg," the French alcohol fuel trophy. MM. Gobron-Brillié and Brouhot are the two firms who will try and capture the prize from Ch. de Knyff, the present holder. The race will be decided during the Paris-Madrid run, on the section between Paris and Bordeaux.

In connection with *L'Auto's* Paris-Nice "Caravan" as already announced the more powerful cars will have extra distances plotted out for them on each stage, amounting to 100 kilometres per day, these extra distances being selected with interesting points as their objective, thereby affording the pleasure to the competitors of an excursion combined with the chance of earning extra credit for the excess distance covered. At present the entries are not coming in very fast, and if the necessary 50 are not forthcoming by March 16th the event will be "called off."

The Heavy Vehicle Trial from Paris to Nice arranged by *La France Automobile* has also been slightly modified by allowing the more speedy cars in categories C, D, F, and G, to start somewhat later than their heavier brethren in categories A, B, and E. The latter will, as originally arranged, start on March 17th, and the former not until March 22nd, both sections arriving at Monte Carlo on the 28th. Over twenty competitors for this event have already sent in their names.

Considerable pressure is being brought to bear by the A. C. de France and others upon the authorities to permit the Paris-Madrid Race to commence at Versailles in order to avoid the traffic immediately outside Paris. It is proposed to start the vehicles at one minute's interval instead of two, in face of the large number of likely competitors, and in addition it is suggested that a light car, voiturette, or motor bicycle should be started simultaneously with the starting of each heavy car. A day's stay will probably be made in Bordeaux, principally on account of the formalities of the custom authorities. This will give ample opportunity for the Bordeaux Club to elaborate their fête programme which they are preparing in celebration of the event. A special train is to be run in connection with the race on the same lines as the Paris-Vienna special, the charge for the tickets probably being not more than 230 francs for the entire journey. The exhibition, which is being organised in Madrid in connection with the race, will be held at the Palacio del Hipodromo. The exhibition at this show of all competing vehicles arriving in the Spanish capital is compulsory.

Record Motor Speed. 82·85 Miles per Hour (133·33 kiloms.).—On Thursday last the Hon. C. S. Rolls, on a Mors car previously owned by Fournier, on the Duke of Portland's Welbeck private road, covered the flying kilometre in 27 secs., equal to 82·85 miles per hour, or 133·33 kiloms. It was only after four tries that this time was accomplished. As an extraordinary achievement Mr. Rolls' record is remarkable, and beats by 2⅕ secs. Fournier's official record time, and also Mr. Charles Jarrott's time of 28¼ secs. on the same track, made last August. The fact, however, that the Welbeck Road has a distinct down grade, will in all probability preclude this record from officially over-riding Fournier's 29⅕ secs. This, however, in no way detracts from the remarkable nature of the performance, which is the fastest time ever recorded for any vehicle whatsoever on the road. It is interesting to know that the tyres used were British-made Dunlops of the latest type, similar to those which were awarded the first prize in last year's 4,000 Miles Tyre Trial. Mr. Rolls is driving the same 80-h.p. Mors car in the Paris-Madrid race, and for our frontispiece this week we reproduce a photograph of Mr. Rolls on the identical car.

Paris Fuel Consumption Trial.—The only unallotted prize in connection with this event, the results of which we gave very fully last week, viz., the medal for the vehicle entered of a standard type without any special alterations made for the trial, has been awarded to the Peugeot firm. The awards in the voiturette class have been slightly modified, the first four now being Nos. 41, 42, 44, and 38, in the order named. Like last year a second trial is to be held between the winning vehicle in each class, the conditions, however, being changed from the previous year. Instead of the vehicles running a certain distance, and their consumption being measured, each one will have a fixed quantity of fuel allotted, the winner in each category being the vehicle which covers the longest distance with the amount of fuel. The route will be the same as during the main trial, the competitors towards the finish continuing to run on a circular course, by the Chalet du Cycle, until their fuel is exhausted. The date fixed is Monday next, the 9th inst. The vehicles entitled to take part are :—*Voiturettes*, Nos. 41, 42 (De Dion Bouton cars); *Light Cars*, Nos. 33 and 32 (Peugeot cars); *Cars*, Nos. 16 and 17 (Chenard and Walcker cars), No. 24 (Bardon); *Heavy Cars*, No. 25 (Bardon), No. 19 (Mors); *Industrial Vehicles*, carrying 1 ton, No. 26 (Bardon), No. 35 (Peugeot). Less than 1 ton, No. 1 (Gillet Forest).

Details of the Germain vehicles specially selected for honour at the Brussels Salon, official notification of which we gave on February 21st, comprise a 7½-h.p. doctor's single brougham, which obtained the gold medal award; an imposing omnibus constructed to carry 22 passengers, specially built to the order of Mr. C. A. Madore, of Durban, South Africa; and a 15-h.p. lurry constructed to carry four tons. Both these latter obtained a silver medal. Under test the omnibus with 22 passengers up, we are informed, covered 16 miles within the hour, proving itself a good hill climber. The lurry with its full weight on board, carrying its freight with ease, climbed a hill of 1 in 6, was stopped half way up, and re-started, and then with the same load descended the hill backwards. We have had on several occasions reason to speak well of this make of motor vehicle, and we are, therefore, not surprised to receive this report of the performances of these particular cars.

One of the large Milnes-Daimler omnibuses is being started in regular service at Hastings almost immediately.

A 12-h.p. petrol car has been in use since December last for inspection purposes, by the Dudley, Stourbridge, and District Electric Traction Company, and has fulfilled every requirement of the staff.

Under the auspices of the Hull Cycle and Motor Syndicate, a successful show was held last week in the Hull Assembly Rooms. Mr. T. R. Ferens, J.P., presided at the formal opening. One of the principal exhibitors was the East Riding Cycle and Motor Company.

The Society of Electro-Chemists and Metallurgists was officially founded last month. Mr. J. W. Swan was elected President, and the Vice-presidents appointed were Lord Kelvin, Dr. Crum Brown, Lord Rayleigh, Mr. Alexander Siemens, and Mr. James Swinburne.

Special efforts are being made by the Yorkshire Automobile Club to increase their membership so as to enable the Committee to establish a Club House and garage for the use of the members. This Club, under the secretaryship of Mr. A. W. Dougill, displays an enormous amount of energy, second only to the parent Club, in popularising automobilism. A short Club Run is announced for to-day (Saturday) to Wetherly *viâ* Harewood and Collingham, contingents joining at Harewood at 3.15 p.m. from Moortown, Leeds, and Manningham Park, Bradford. At Easter a week-end tour is being organised, in the form of a circular route, to enable members to join each day.

The Clacton-on-Sea 10-miles motor racing track has been inspected by the Hon. John Scott Montagu, M.P., Mr. Charles Jarrott, Col. Howard, J.P., of Colchester, Mr. C. Val. Hunter, Mr. Grant, of the Grand Hotel, Clacton, &c., and appears to be in many respects a good site for the purpose. With ordinary field glasses the 10 miles circuit can be easily followed from the grand stand, and provided sufficient support is given to the undertaking an important part of the scheme will be to foster marine motoring, as a considerable fore-shore forms part of the Alton Park Club, by which title the undertaking is to be known. Mr. W. G. George, of 61, Chancery Lane, who is acting as Secretary, is energetically pushing forward this proposal, and will supply any further particulars upon application.

The catalogue just to hand from the London Motor Garage Company is a remarkable production, as all the chief illustrations of the various cars, including the "Pipe" vehicles and Magnet cars, are in colours, and give an excellent idea to the purchaser of the style of carriage which the Company have to offer. In addition to these two makes, full particulars are given of the Lanchester and the Mercedes-Simplex cars, besides a table of speeds, and full particulars of the garage, accessories, repairing departments, and information upon the other branches of the automobile business for which the company provide. The publication is one that should be secured by automobilists who are considering their purchases for the coming season. The company have arranged, in addition to their present premises, for establishing a new garage at 33 to 37, Wardour Street, W., which will be available before the season is in full swing.

In Boston, U.S.A., the rival automobile show mania has broken out very badly.

A French motor cycle club is to be formed in association with the A.C. de France.

To introduce motor transport for passengers and goods into the Portuguese capital, a Company has been formed in Lisbon, with a capital of £150,000. A series of services will be inaugurated between Lisbon and the principal adjacent towns.

Charles A. Duryea has arranged with the United States Rapid Vehicle Company of New York to take over his patents and manufacture cars built in accordance with them. As a start, 100 cars are to be constructed which it is stated will differ materially from the well-known Duryea designs.

Petroleum has been earmarked as a source of revenue by the French Government. A tax of 1·25 francs per 100 kilogs., or 1 franc per hectolitre is to be enforced for the future. In principle it has also been decided that the refining of petroleum shall be made a Government monopoly.

The improvement of roads is receiving an enormous amount of attention at the present moment in the United States. A novel scheme has been started by the Pasadena (Cal.) Automobile Club, by which the Club members are making automobile runs to Pomona and back, carrying passengers for hire, and devoting the money to the local road improvements. Practical evidence, it is claimed, will by this means be given to the public of the need of better roads.

An important project is being considered by the Belgian Government for building an automobile road between Ostend and Blankenberghe. In addition to the splendid run of about 15 kiloms. for automobiles which this will give, it should prove a source of great convenience for visitors to these two popular seaside resorts, as the communication at present existing between the two towns is extremely inadequate.

The torchlight procession of automobiles being held this evening (Saturday) in Berlin before the Emperor William, as a preliminary to the opening of the Berlin Automobile Exhibition, has developed into quite an important function. The encouragement received on the Continent from all sections of the community is in remarkable contrast to the treatment in many respects in Great Britain. To help towards the success of the procession the German Minister of Public Works has notified that all automobile vehicles from the provinces taking part in the procession will be conveyed to Berlin and back to their destination free of charge.

A new catalogue has been issued by the Thornycroft Steam Wagon Company, Limited, of Basingstoke and Chiswick, which illustrates very fully the whole of their series of industrial vehicles in addition to giving particulars of their latest production—the petrol passenger car. The catalogue is divided up into a series of seven parts, A to G inclusive, which renders it particularly convenient for reference and distribution, as each section deals with a special type of make by the Company, and the particular requirements of each individual applicant can, therefore, be dealt with without having to send an unnecessary quantity of matter. Catalogue A gives the steam wagons and the Thornycroft system generally, B embraces standard vehicles, D steam passenger vehicles, E Colonial steam wagons, F is a *résumé* of opinions of users and extracts from the press, G contains a preliminary description of the petrol passenger car recently described by us, and a final booklet gives a full description of the Basingstoke works of the Company.

DOINGS OF PUBLIC COMPANIES.

A dividend of 7 per cent. for the year 1902 has just been announced by the Century Engineering and Motor Company, Limited, of Willesden Junction. For the third time this Company have found it necessary to enlarge their factory, having doubled their premises in November last. A new catalogue has also just been issued by them, which not only deals fully with the principal features of their well-known Century tandem, but gives also a full description of their various cars, ranging from 6½ to 16 h.p.

The Motor Traction Company, Limited.—Since the rejection of the reconstruction scheme by the confirmatory meeting of this Company, held on December 29th, important developments have been proceeding, and on Wednesday last, the 4th inst., at an extraordinary general meeting of the Company, fresh proposals were placed before the shareholders, and passed unanimously, which give promise of considerable relief in respect to the future of this undertaking. The meeting was called to ratify a preliminary agreement entered into with the Fischer Motor Vehicle Promotion Syndicate, which provides for the sale to the Fischer Syndicate, from January 1st last (free from debts and liabilities existing at that date), of the whole of the Company's undertaking and property, with the exception of cash in hand, debts and monies owing to the Company on December 31st last, and the Company's interest in the Holden Motor Patents Syndicate and all Holden bicycles and engines or parts thereof, and all special tools adapted solely for the construction thereof, for the sum of £60,102, payable as to £20,796 in cash and £39,306 in ordinary shares of a company to be registered for taking over the agreement of the Fischer Syndicate. £9,204 is to be provided by the new company for working capital. This arrangement will, after discharging all liabilities of the Company, provide a sum sufficient to make a return in cash of about £1 10*s*. per share to the shareholders in addition to 3 fully-paid shares of £1 each in the new company to be registered. The proposal received the full support not only of the directors but of the shareholders' committee appointed to enquire into the Company's affairs.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

A.B.P. Accumulator Company (Limited), Parkfield Works, Stockton-on-Tees.—Capital, £20,000 in £1 shares. Object, to acquire the accumulator department of, and to adopt an agreement with Ashmore, Benson, Pease, and Co. (Limited), and E. C. H. T. Lugard. The first directors are E. Schweich, R. S. Benson, and E. L. Pease.

Durrant's Motors (Limited).—Capital, £5,000 in £1 shares. Object, to acquire an invention of E. A. Durrant, relating to improvements in gas and oil engines and explosive motors generally; to adopt an agreement with E. A. Durrant and W. F. Cockrell, &c. The first directors are W. F. Cockrell, B. R. Banks, and E. A. Durrant.

Ilford Motor Car and Cycle Company (Limited), 12, Market Place, Ilford, Essex. Capital, £2,000 in £1 shares. Object, to acquire and carry on the business now carried on by F. G. Galley and G. T. Galley under the style of the Ilford Motor Car and Cycle Company, at Market Parade, Ilford.

Singer Motor Company (Limited), Canterbury Street, Coventry.—Capital, £1,000 in £1 shares.

Wasp Motor and Cycle Company (Limited), Worcester Street, Wolverhampton. Capital, £1,000 in £1 shares.

LAW REPORTS.

Police "Evidence."—Alleged Perjury by a York Police Constable.—The magistrates sitting at the York Police Court, on February 26th, were engaged for several hours in hearing a charge of wilful and corrupt perjury brought against Arthur Robinson (26), until recently a constable in the city police force. Mr. R. P. Dale (Town Clerk) prosecuted; Mr. Arthur Willey (Leeds) appeared for the defence. The Town Clerk said the charge arose out of testimony given by the defendant in the local police court, on January 26th, in a case in which Robert Baldrey was summoned for driving a motor car over the regulation speed. Robinson then said that he timed the motor car with a stop watch. Asked where it was, he said he had left it at home. Baldrey was fined 10*s*. and the costs. On the following day the defendant was told by Superintendent Woolnough that the Chief Constable wanted to see the stop-watch, and the superintendent walked home with him to get it. The defendant went into his house and returned with a small silver watch, and said, "This is the watch I was meaning,' and added the following curious statement: "I broke it a fortnight ago." Superintendent Woolnough, noticing that the watch was not a stop-watch, and that the second hand was missing, remarked, "Do you call this a stop-watch?" and the defendant replied, "That is what I understood it to be." The defendant was afterwards seen by the Chief Constable, who asked him, "How could you time the car to seconds with a watch without a second hand?" and he then said that he had made a mistake and given Superintendent Woolnough the wrong watch. Asked where the actual watch was, he produced a metal stop-watch, which was broken, and said, "This is the watch I was wearing." Subsequently he was suspended, and afterwards was dismissed by the Watch Committee. It would be proved that the stop-watch the defendant produced was in the hands of Mr. Sharp, pawnbroker, on January 28th, and had been in his possession for some twelve months previously. On the morning of that date he sold it to a youth who could not be traced. Witnesses would also be called who would state that the defendant had not a watch in his hand when he stopped the car. The Chief Constable, in the course of his evidence, said that when he told Robinson that it had been ascertained that the stop-watch he produced had been purchased at Sharp's after the charge against Baldrey had been dealt with, he replied, "I am eager to confess that I bought the watch, and I am very sorry." Before the Watch Committee Robinson asked to be leniently dealt with. Several other witnesses were called in support of the case, and ultimately the prisoner was committed for trial at the Assizes.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1901.

Published March 5th, 1903.

22,406.	J. W. Hall. Fluid-pressure power transmission apparatus.
22,866.	T. W. Barbeb. Mechanically-propelled vehicles.

Published March 12th, 1903.

23,122.	A. Vogt. Internal combustion motors.

Applied for in 1902.

Published March 5th, 1903.

3,173.	B. J. Diplock. Traction and other engines.
3,466.	La Société Anon. Mors. Speed and direction-changing mechanism.
4,457.	W. C. Holloway. Motor cars.
5,012.	M. D. Rücker. Air tubes for pneumatic tyres.
5,125.	H. A. Cutmore. Signalling apparatus.
5,588.	W. G. Wilson and Wilson and Pilcher. Piston rings.
5,607.	W. Norris and Coulthard and Co. Vertical steam boilers.
5,701.	J. A. Thumling. Change gear.
6,109.	Hon. C. S Rolls and C R. D'Esterre. Internal combustion engines.
6,623.	A. H. Huth. Spring wheels.
6,904.	C. T. Crowden. Motor cycles.
10,898.	R. Mathot. Automobile vehicles.
17,777.	H. Pieper. Means for governing internal combustion engines.
27,276.	M. Bauer and R. Steinhaeuser. Regulating device.
27,491.	A. A. Low. Feed-controlling mechanism.
27,893.	C. Jenatzy. Transmission devices.
28,415.	E. Korting. Apparatus for regulating combustible mixture.
28,783.	C. H. Clare. Storage batteries.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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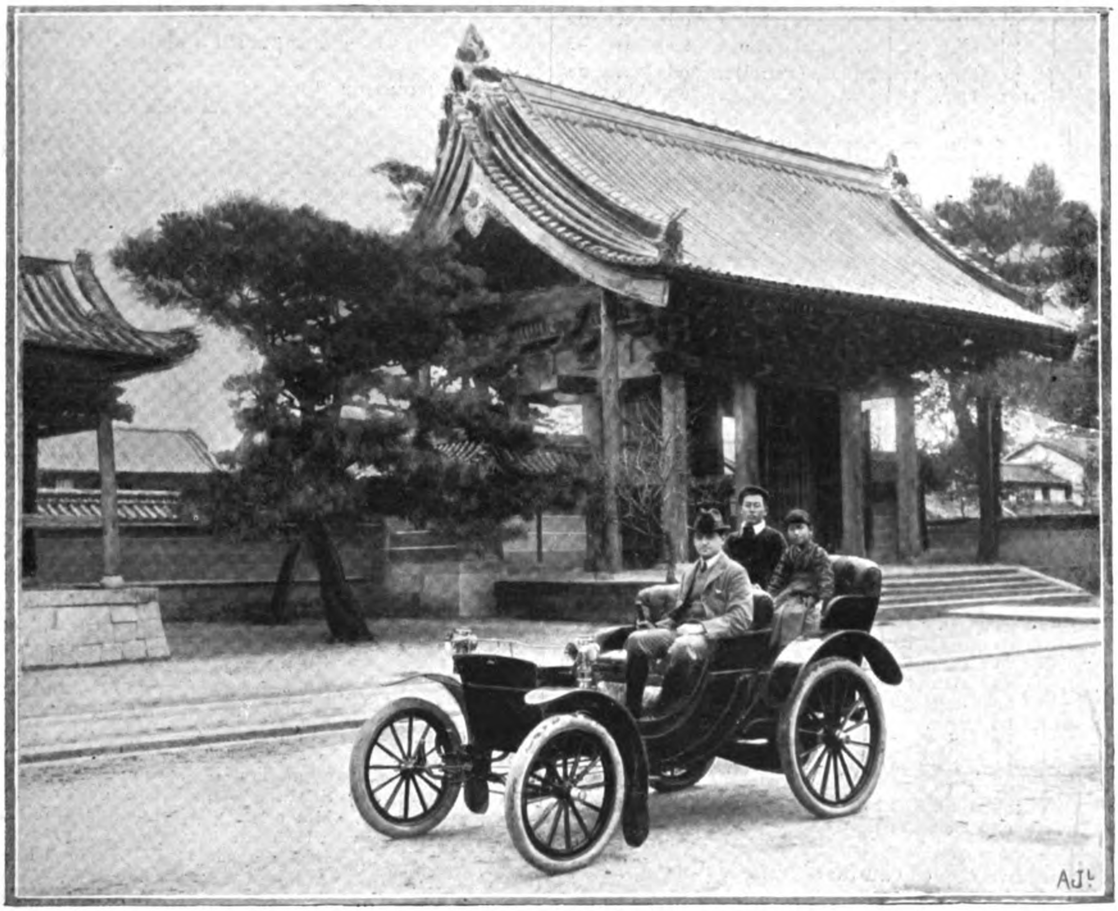

In the Land of the Chrysanthemum—A Duryea Car in Old Japan.

CARS AND SYSTEMS.

FULL illustrated descriptions of the majority of the leading motor vehicles and systems have appeared in THE AUTOMOTOR JOURNAL during the past year. These enable the mechanism and functions of the various parts pertaining to each separate system to be clearly understood. The cars and systems described include the following :—

	No.		
Brooke	67	April	19
Brush	68	"	26
	82	Aug.	2
Simms Motor War Car	67	April	19
Benz-Parsifal	68	"	26
	106	Jan.	17
Bardon	69	May	3
Deschamp	70	"	10
Gillet-Forest	70	"	10
Roots and Venables	70	"	10
Wolseley	71	"	17
	73	"	31
	74	June	7
Napier	71	May	17
	101	Dec.	13
	107	Jan.	24
Blake	72	May	24
Humber	75	June	14
	76	"	21
	82	Aug.	2
	108	Jan.	31
Fischer	75	June	14
	87	Sept.	6
Meredith	75	June	14
Rex	77	"	28
Gardner-Serpollet	77	"	28
	78	July	5
	79	"	12
	80	"	19
Oldsmobile	80	"	19
	86	Aug.	30
Daimler	81	July	26
	82	Aug.	2
Ivel	81	July	26
Renault	81	"	26
Gladiator	82	Aug.	2
	104	Jan.	3
Protos	83	Aug.	9
Weston	83	"	9
Chatel-Jeannin	84	"	16
Brightmore	85	"	23
Lister	85	"	23
Prescott	85	"	23
Pioneer	86	"	30
Ariel	89	Sept.	20
	90	"	27
	91	Oct.	4
Wilson and Pilcher	90	Sept.	27
	108	Jan.	31
Motor Mfg. Co.	92	Oct.	11

	No.		
Princess	92	Oct.	11
Swift	93	"	18
Milnes-Daimler	94	"	25
	95	Nov.	1
	112	Mar.	7
White Steamer	95	"	1
	96	"	8
	106	Jan.	17
Clarkson and Capel's "Chelmsford"	96	Nov.	8
	97	"	15
	98	"	22
Alsop	97	"	15
Alldays and Onions' "Traveller"	98	"	22
	99	"	29
Toledo (Petrol)	98	"	22
" (Steam)	107	Jan.	24
Peerless	98	Nov.	22
Pedrail	98	"	22
Watsonia-Durkopp	99	"	29
	100	Dec.	6
	101	"	13
Pipe	102	"	20
Wartburg	104	Jan.	3
Darracq	104	"	3
De Dietrich	104	"	3
Charron, G. V.	104	"	3
Ader	104	"	3
Hubèr	105	"	10
Delahaye	105	"	10
Krebs Carburettor	105	..	10
Velox	105	"	10
	106	"	17
De Dion	106	"	17
Mercedes	107	"	24
Becket	108	"	31
Waddington	108	"	31
Chenard and Walcker	108	"	31
	109	Feb.	7
City & Suburban Petrol-Electric Car	109	"	7
Thornycroft Petrol Car	110	"	14
Earl	111	"	21
Germain (Electric change-speed).	111	"	21
Locomobile (1903)	112	"	28
Cottereau	113	Mar.	7
Simplex Speed Gear	113	"	7

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DIARY OF FORTHCOMING EVENTS.

British Events.

1903.	
*March 13	"The Motor Problem a Road Problem." Paper by Mr. W. Rees Jeffreys.
March 21–28	Cordingley and Co.'s Exhibition, Agricultural Hall.
*April 10	Eliminating Race for Gordon-Bennett Race.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14	Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
*June 13	Gymkhana at Ranelagh.
*July 7	Gordon-Bennett Cup Race.
*July 11	Speed Trial at Dublin.
*July 13	Start for International Tour through Ireland.
*July 15	Motor Boats Race, Queenstown Harbour (Alfred Harmsworth Challenge Cup).
*July 18	International Hill Climbing Trial at Belfast (Henry Edmunds Trophy).
*August	Tourist Motor Bicycle Reliability Trial.
*September	The 1,000 Miles Trial.
1904.	
	*Light Van Trials.
*Feb. 12–24	Crystal Palace Exhibition.

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.

March ...	... "Criterium du Quart de Litre" (*L'Auto.*)
March 8-22	... Berlin Automobile Exhibition.
March 16-30	... Vienna Automobile Exhibition.
March 17-28	... "Criterium des Transports Automobiles." 1,072 kiloms. (*La France Automobile*). Classes A, B, E.
March 22-28	... Ditto. Classes C, D, F, G, 1,014 kiloms.
March 28-April 5	Nice Automobile Week.
April 16-20	... A. C. de Touraine Tourist and other Trials.
May ...	... Speed kilom.—Geneva (Swiss A. C.).
May 14 ...	... Paris-Madrid. Start of Tourist Section.
May 16-24	... Stockholm Exhibition.
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June	... Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-23	... Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 25-July 1 ...	Aix-les-Bains Auto Week (Auto Club du Rhone).
July ...	... Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
July 5 ...	... Laffrey Hill Climb.
July 5 ...	... Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 19 ...	... Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August ...	... Circuit des Ardennes.
August 16	... Race Trelex-Saint-Cergves (Swiss A. C.).
September	... Udine Exhibition (Italy).
Oct. 15-21	... Leipzig Exhibition.
Nov. 15 ...	... German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

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PASSING EVENTS.

MORE ROYAL ENCOURAGEMENT.

THE motor car parade which took place in Berlin on Saturday last before the Emperor was an imposing ceremonial from every point of view, whether we consider the picturesque effect produced by the illuminated and decorated cars, the historic associations of the route through the Brandenburger Thor, along Unter den Linden, up to the old Schloss, sacred to memories of Frederick the Great and the Great Elector, where the Emperor reviewed the procession from the balcony, or the importance which such a celebration possesses for the motor industry of Germany and of the world. There were upwards of 300 cars assembled altogether. Some of them were driven by the most prominent members of the German aristocracy. Decked with flowers and illuminated with innumerable electric lights, they wound their way in and out of the Thiergarten before mustering in the neighbourhood of the celebrated gateway for the actual march past. The attitude of encouragement to the automobile movement thus publicly adopted by the German Emperor is further evidence, if any were needed, which it is not, of the enlightened and far-seeing views which that monarch holds on industry and commerce generally, and particularly on the necessity of the protection and patronage of new and growing industries. On the occasion of a State visit to this country the German Emperor expressed surprise and dissatisfaction (as a private individual he would probably have said disgust) at not having introduced to him any of the representatives of industry, technology, or science. He knew such persons existed in this country, but they were kept out of the official programme. Things would probably be different now. King Edward takes more the same kind of view that the German Emperor adopts. At any rate, he is extremely friendly to the automobile, and has done a great deal to promote its interests. But from various reasons the German Court is enabled to adopt a more independent and unfettered line in such matters. It is pleasing to find these exceptional powers exercised so fully on behalf of progress and improvement.

PETROL IN INDIA.

WE referred recently to the great field that India in the future is likely to afford for the growth of the automobile industry. It seems, however, that certain difficulties at present stand in the way of satisfactorily developing business in the Dependency. It may be that the fuel is slightly more inflammable than in this country, owing to the higher temperature generally prevailing, but we doubt if the difference is as serious as is generally supposed. The seriousness is really due to the attitude of the authorities, and particularly the railway companies, to its transport. Unsympathetic as that attitude is here, and stringent as are the regulations put in force, they are much more so in India, with the consequence that petrol is only procurable at a very high price and in very limited quantities. The result is to hamper motor car enterprise and also to prevent manufacturers from attempting to develop a market for motor cars through the belief that the sale of them will be handicapped for want of a suitable fuel. A situation somewhat resembling a deadlock consequently prevails. We fancy that it is to this cause rather than to the inapplicability of the lighter fuel that the demand in India for vehicles using paraffin oil is to be traced. To some extent the difficulty might be met by using a slightly heavier oil than what passes by the name of "petrol" in this country. Under the different climatic conditions prevailing in India it would be probably just as effective in explosion engines as petrol is here. It would be a good plan to give such an oil a new name. A great deal was done for the motor industry in this country when Messrs. Carless, Capel, and Leonard proposed the term "petrol." People were terribly afraid of benzoline. They were less afraid of petrol. If an oil with a specific gravity and flash point between the petrol used in this country and ordinary kerosene were introduced in India, say under the name of "kerol," probably an excellent business could be done with it, especially if an energetic automobile club were formed for popularising motoring. The great oil companies, at any rate, are strong enough to adopt the same line they have done here and guarantee the railway companies against damage resulting from the carriage of the fuel.

"ARISING out of that" (as they say in introducing supplementary questions in the House), we may mention that a motor car has actually appeared in Rangoon, where, we are informed, it is to be seen bowling merrily along in the streets. It excites, apparently, a good deal of local envy, as in Burmah the roads are hot and dusty and distances often great, while the animal traction is exasperating to a degree. One sentiment of the Buddhist Burmans will prove very favourable to the introduction of motor traffic. They have an intense dislike to over-working or over-driving draught animals. Fielding, in his book on Burmah—"The Soul of a People"—mentioned that the Burmese absolutely refused to avail themselves of a cheap omnibus service in a certain district because the horses were ill-treated and over-driven. This means a great deal in a hot climate like Burmah. There, popular prejudice ought certainly to be in favour of the motor car.

A FINE FRENZY.

IN dealing last week with Mr. Norman's article on the "Coming of the Motor Car," we pointed out that it was of a decidedly stimulating character. An imaginative writer in a local Surrey paper has been considerably, we might say dangerously, stimulated by its perusal. He has even been dreaming of a Surrey in which motor cars are allowed to go as they like, and in which the roads are packed, at any rate on Sundays, by a "petrolescent throng." Here is the vision which this fevered imagination has conjured up:—"What a sight the Portsmouth Road—from London to Hindhead, say—will be on a fine day. Filled with the hum of wheels, the buzz of conversation, and the ring of laughter, astir with the easy movement of the swiftly-gliding cars, packed and alive with the petrolescent throng." We do not gather from the writer that this happy age has been preceded and introduced by remedial legislation, so we are reluctantly compelled to the conclusion that at some time in the near future the inhabitants of Surrey, exasperated by loss of trade, and smarting under frequent thefts of cabbages, from which, according to Lord Onslow, they now suffer while the police are ambushing motor cars, will have risen *en masse* and extinguished, painlessly or otherwise, the magistrates and County Councils. The police will probably not have been included in the holocaust, for after all in these matters they only do what they are told to by the combined committees of magistrates and county councillors who supervise and direct their activity. They don't, in the majority of cases, like the job. There is no doubt at all about that, and they will probably be as pleased as anybody when they get different marching orders from "the tin gods on wheels" whom at present they are compelled to obey. However, our colleague is, after all, only allowing his imagination to take time by the forelock, for the picture he presents will no doubt be realised very closely, and perhaps sooner than is generally supposed.

A COUNTER IRRITANT.

A GOOD deal has been written in the automobile press generally, and letters have appeared in our correspondence columns, directing attention to the unpleasant state of affairs which sometimes arises in consequence of demands being made by chauffeurs for commissions or donations from manufacturers or agents from whom their employers have purchased cars. This, as we have had occasion to point out, is perilously close to blackmail, and is not always very easy to deal with satisfactorily. To take a hint from the ingenious Chinaman is sometimes beneficial in various walks of life. In China wealthy men only pay their doctors while they remain in health. As soon as the employer becomes ill, the doctor's wages stop until he gets well again. It has been suggested that a similar method of remunerating chauffeurs might prove satisfactory in the automobile world. The chauffeur should draw his emolument so long as the car is running, but when it is incapable of so doing, except, of course, from accident or some other unpreventable cause, the chauffeur's emolument should suddenly stop. There is no doubt that the number of days' work to be got out of cars would be in many instances increased by this simple expedient. It would also, at the same time, effectually prevent the levying of blackmail by chauffeurs against manufacturers. Wherever the manufacturer was strong enough to resist the demand, or where he did not feel for other reasons disposed to comply with it, the chauffeur would be unable to make any implied threat effective, as he could only do so at his own expense.

MUCH ADO ABOUT NOTHING.

THE almost feverish anxiety that has been so much in evidence for some little time in certain quarters to claim the credit for having originally made the suggestion that the Gordon-Bennett Race should be run in Ireland, has to those behind the scenes been a source of considerable amusement. The point in itself is, of course, of no moment whatever, as everyone really interested in automobilism had but one desire, that the race might in any case be run in the British Isles. The exact spot was a mere detail. Whilst these vapourings were confined to mere general claims it was hardly necessary to refer to them at all, but for the first time a really authoritative statement has been issued with definite dates. Mr. S. F. Edge in regard to this subject writes us as follows:—

> I notice that a claim has been put forward as to who was the originator of the idea of holding the Gordon-Bennett Race in Ireland. The first suggestion I heard for the Race to be held in Ireland was from Mr. Claude Johnson, the Secretary of the Automobile Club. He suggested that Ireland was the only possible place, either in the afternoon that I arrived in Vienna directly after I won the Gordon-Bennett Race of 1902, or else on the following morning when I went with him to the Austrian Automobile Club House. The date would be the 29th or 30th of June, 1902.
>
> The suggestion for the improvement of the Irish course was suggested by Mr. Johnson on January 13th, 1903, when I was in Ireland inspecting the proposed course.

This should once and for all dispose of the little difference of opinion in regard to the claims of all parties. The amount of energy brought to bear upon the subject has been almost worthy of the extremely difficult task of engineering through Parliament the necessary measure for enabling the race to be held.

RESURRECTION.

IT is almost impossible to invent a new primary battery, or even a new way of working one, but it is not at all hard to dish up an old idea and persuade the untechnical Press that you have introduced a world-shaking novelty. This is what appears to have happened in the case of the battery of Mr. Halsey of New Jersey. His battery consists of zinc and carbon plates immersed in sulphuric acid. The carbon plates are circular, and a motor which takes a little current from the battery revolves the carbon plate, all portions of which are accordingly alternately immersed in acid and exposed to air, the air acting as a depolariser. This device is almost as old as the primary battery itself, though it has now been put into commerce and called the "Never Die" Battery. Perhaps "resurrection" would be a more suitable soubriquet.

THE NUMBERING QUESTION.

WE do not think that the majority of the meeting at the Automobile Club, on Friday in last week, which voted in favour of the resolution against the numbering of vehicles were altogether well advised in their action. Of course nobody welcomes the idea of careering about the country with a large number attached to his car. And even if the means of identification ultimately adopted should take a less objectionable form, there are still many who prefer to be without them. But that is not really the question. Those members of the Automobile Club who have so long and so ardently, and with such considerable sacrifices of time and energy, devoted themselves to the question of legislative reform, have satisfied themselves, by direct personal contact with Members of Parliament in the present Government, that there is no chance whatever of obtaining the abolition of the speed limit unless, at the same time, some means of identifying vehicles while in motion are provided.

We have ourselves on repeated occasions pointed out that if such a proposal is to be embodied in any statute it must be accompanied by the most wide-reaching and reliable safeguards against its abuse by the police or others. Those who voted in the majority, however, do not appear to have refused to agree to the numbering proposals or other methods of identifying moving cars through any such reason as this. They simply don't want numbers or means of identification and won't have them, while at the same time they, or a great number of them, are anxious to have the speed limit abolished. The position of the Legislative Committee of the Automobile Club on this matter is a quite unprejudiced one. They are as little in favour of numbering for its own sake as those who voted for the motion, but they are aware, as these gentlemen probably are not, that the acceptance of some such condition is indispensible if the abolition of the speed limit is to be hoped for. In refusing to accept any such restriction, those who voted for the motion really put themselves out of court altogether, and it is only too likely that the public generally, and members of Parliament as well, will come to the conclusion that automobilists are a class of people who want everything and will make no concession in return. It would be very unfortunate if this opinion were generally to gain ground, and we trust therefore that the poll of all the members of the Club which is being taken by post will not result in the support of the motion suggested by Earl Russell. If it does result in supporting it, we feel confident that such a vote will have the effect of retarding the prospects of remedial legislation very considerably, and this, it is needless to point out, will have a very prejudicial effect on the prospects of the industry.

There is no doubt that Lord Russell's distinctly able and eloquent speech largely contributed to the passage of the motion which he suggested. It was full of excellent observations, terse, and to the point, and often amusing. Said the Earl:—"It is perfectly true that there are persons in the country, and especially no doubt the police, to whom it is tiresome to hide behind the hedges, who would like to have our cars numbered, and who would like to have an easy means to serve you with a summons a fortnight after the event without having to stop you or give you any notice at the time." Further on he says, "Who in this room, full of experienced automobilists, believes that any number 3 inches in height, or even 3 feet in height, could be identified on the back of a motor car travelling at 40 miles an hour? The only thing you will see when the car has passed is a cloud of dust. The first thing that Mr. Firth will say if he defends a gentleman who has had his number taken, will be, "How can you possibly swear to the number of that car, when it flew away in a cloud of dust?" "So," concluded Earl Russell, "this is not a practical proposal." Both these things can hardly be true, at any rate to a contradictory extent. The less the use of putting numbers on cars because the police cannot see them, the safer automobilists will be from the other evil of being summoned promiscuously without notice or knowledge of the circumstances when they offended. However, Earl Russell's attack was a trenchant one. On the whole, the proposed legislation is open to it. It was open to it because in spite of the fact that the necessity of safeguards has been repeatedly pointed out by a number of people, and by ourselves on a variety of occasions, no adequate safeguards were embodied in the proposed measure put forward.

As regards the gradual diminution of prejudice, we quite agree that that salutary change of opinion is in course of gradual progress, but that is really to a large extent beside the question. Even if instructions cease to be issued to the police as at present, there are always cranky individuals to whom the preservation of their prejudices is the breath of life. As long as the speed limit exists they will be able to take action, and, what is more, under the Highway Act the driver of any carriage is obliged under penalty to give his name and address to any person that charges him with an offence. Though magistrates, county councils, and police *may* become unprejudiced, there are always these cranky individuals to consider, and they are the sort of people who go in for *mandamuses* when magistrates refuse to act.

What gave its force to Lord Russell's attack was, as we have above indicated, the absence of adequate safeguards against abuse on the part of the police of the serious powers which the numbering of vehicles would place in their hands. It was attempted to meet the case by passing a resolution "that, in construing the enactment as to furious driving, speed of a motor car shall not in itself be evidence of furious driving." But, as we said on December 13th last, when this suggestion was first put forward, we do not think it adequate. If a policeman takes a number, it is just as easy for him to make the charge that the car was driving all over the place, endangering foot passengers and the residences of the neighbouring gentry, and all objects within 50 yards of the road on either side, which would be driving "so as to endanger the life and limb of passengers," as it is to say that the car was merely going at excessive speed. And the driver of the car won't know anything about it till he gets the summons unless the adequate safeguards which we have recommended are adopted. We put these forward as long ago as July 19th last. They were:—

> "A reasonable requirement under the new Act, as we have previously pointed out, would be that, in every case where a charge is made, the driver should be stopped and informed he is to be summoned. He would then know he would be prosecuted and would be able to meet the charge. Wherever the charge of driving to the common danger is brought against an automobilist, that common danger must be independently proved; and 'independently' should be explained to mean by somebody other than the policeman who makes the charge."

It was the absence of provisions of this kind in the proposed legislation which gave Lord Russell's remarks the logical force they possessed. Had these or equivalent provisions been embodied in the proposals, his remarks would have been largely deprived of point. Of course, it does not follow that he would not have carried his resolution. Resolutions are carried in spite of logic as often, if not oftener, than by means of it, but there would be less probability that the passage of the resolution would be endorsed by the other members of the Club.

In spite of much discussion on the subject, it is not as fully realised as it ought to be that the mere abolition of the speed limit will not be sufficient. There is still the old Highway Act of 1835 and others. We have insisted a variety of times on the necessity of some provision of this kind. We would specially refer our readers to our special article on the subject published on November 29th last. The suggestion put forward above is not, in our opinion, as already stated, an adequate safeguard.

As far as the *legal* objections to the numbering of vehicles or any other means of identification are concerned, the adoption of the proposals we have repeatedly put forward would, it appears to us, remove them. It is otherwise as regards what we may call the sentimental objection advanced by several of the speakers and largely entertained by automobilists. Whether this can be got over by substituting some of the other means of identification that have been proposed for the carrying of numbers remains to be seen, but there is little doubt that some concession will have to be made. The situation is—either automobilists must be content to accept the present state of things and trust to the gradual diminution of prejudice—an unsatisfactory course as we have pointed out above—or they must be prepared to give *quid pro quo*. The Committee of the Club have come to the conclusion, on very important grounds, that the concession that they have proposed is likely to prove acceptable to the authorities. Neither the followers of Earl Russell nor any other automobilists need run away with the idea that they will get the speed limit removed without any corresponding concessions on their behalf.

The measure put before the meeting and now to be voted on by post is practically dead, and probably at an early date a new measure will be drafted—in fact Mr. Scott Montagu practically said so. Doubtless, a number of persons are of opinion that it may be a good thing to leave well alone, and that the drafting of such a measure is superfluous. In that we venture to think they are mistaken. There is no doubt that sooner or later the Government will bring in a Bill. It is essential that when that is done some draft measure should be in existence formulating the proposals on which the Club, or a majority of the Club, are in agreement, as an irreducible minimum if nothing else. Otherwise it is not at all beyond the bounds of possibility that the ultimate outcome may be that automobilists will remain saddled with the present or a very slightly increased speed limit and be compelled to carry numbers as well.

Nor must another danger be forgotten. The Local Government Board have power, as was pointed out during the discussion, to impose the carrying of numbers, names, or any other means of identification that may seem good in their eyes, without further legislation, though they cannot increase the speed limit beyond 14 miles an hour without the passage of a further Act. We don't suggest that there is any intention on their part to act in this way. But they can if they like, and it would perhaps be as well for automobilists to bear this fact in mind when they feel inclined to take up a too uncompromising attitude generally.

ARTIFICIAL PRODUCTION OF HYDRO-CARBONS.

IRON, as is well known, forms a carbide with carbon and white cast-iron may contain in this form nearly as much as 4 per cent. of carbon combined with it. When steam is led over powdered white iron of this kind, kept at a high temperature, the iron oxidises and the carbon combines with the hydrogen of the water to form a gaseous hydrocarbon. This reaction is very similar to what occurs when calcium carbide is acted upon by water, the carbon when set free from a combination having a power to combine with the hydrogen which it would not otherwise possess. The hydrocarbon that has hitherto been obtained in this way is gaseous, containing 3 atoms of carbon to 8 of hydrogen, but it not only occurs in crude Pennsylvanian oil but all the oils obtained naturally from the same source (whether gasolene or lamp oil) are chemically substantially the same thing, the only difference being in the percentages of carbon and hydrogen. It is quite conceivable that by regulating the temperature at which the reaction is carried out gasolene or even lamp oil might be produced in this artificial manner. It is even held by some experts that the oil occurring naturally in various oil fields has been produced by a process of this kind going on continuously below the earth's surface. At any rate the enormous output of the oil-fields which apparently suffers no diminution in spite of the great quantities that have been drawn from them suggests some explanation of this kind. It seems almost impossible to avoid concluding that something is going on below the surface to replace the excessive draughts that are being made on the oil stores contained below the fields. In Pennsylvania alone, during a period of twenty-five years, the output amounted to upwards of 260,000,000 barrels of 42 gallons each. The annual output is now upwards of 25,000,000 tons. The commercial prospects of artificial oil production by any development of the above process are not at present therefore of importance. But if at any future date the oil-fields should show indications of exhaustion, a commercial process by which artificial fuel could be produced economically from such cheap materials as cast iron and steam, might have an important application.

* * *

THERE is no doubt that the American team who come to compete for the Gordon-Bennett Cup will have a tremendous time of it on this side of the Atlantic. Their sojourn among us will without doubt be one giddy whirl of fêtes and entertainments—at any rate after the race, though before it perhaps the necessities of preserving a clear eye and steady nerves will probably do something to restrain the orgie of hospitality, to which they will be exposed, within moderate bounds. Mr. Letts, of the Locomobile Company, who has experienced much kindness when in the States himself, is arranging to extend to the American team hospitality of a very harmless, wholesome, but decidedly useful order. He proposes to put the Locomobile Garage at Kensington at their disposal for housing their cars during their stay in London, and as these premises are thoroughly fire-proof and his Company have special facilities for bringing up cars from the docks, no doubt the offer will prove a welcome one. All the foreign competitors will no doubt be treated most courteously, but Mr. Letts, with his usual readiness to "grasp the skirts of happy chance," has been the first to make any sort of proposal.

THE MAUDSLAY 1903 PETROL CAR.

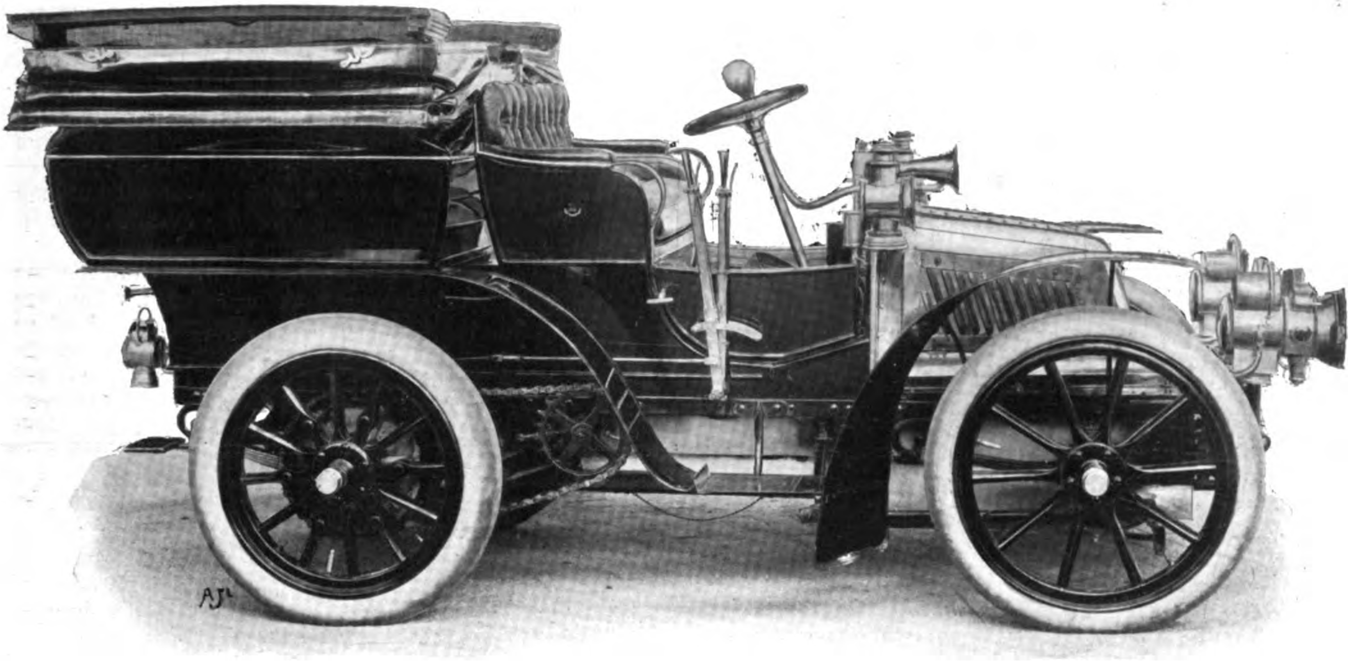


FIG. 1.—20-h.p. Maudslay Lonsdale Wagonette, with hood folded down.

ALTHOUGH the Maudslay Motor Company's cars were only put on the market last year, the Company have done extremely well with them, and the vehicles have proved themselves worthy to rank amongst the best now on the market. Their chief features are already well known to the majority of our readers. It will be remembered that one of these cars took part very successfully in the Reliability Trials of last year. The Company also exhibited at the last Agricultural Hall show as well as at the Crystal Palace recently.

These cars are probably best known as being fitted with 3-cylinder motors, and as being large and roomy cars with plenty of power at their disposal. In general respects the 1903 design resembles that of last year, but many improvements have been made since then, and the engine, in particular, has undergone a considerable amount of development. No attempt is made to sacrifice either reliability or durability in order to cut down the price, and in one or two respects they are by no means cheap vehicles to build. Accessibility is one of their strongest characteristics, and it may be added that the lubrication system throughout is equally complete.

Another characteristic of the Maudslay cars is that the bodies which are fitted to them are extremely roomy and comfortable; although capable of running at comparatively high speeds, the convenience of the passengers has received the first attention of the designers. The standard chassis, with its 20-h.p. engine, when equipped with its roomy tonneau body, enables speeds of 50 or 60 miles an hour to be obtained, the top gear giving 40 miles an hour, with the engine running at its normal speed. The wagonette omnibus, whch has a removable top, is specially constructed for the use of those living in the country, and is geared up to a speed of 20 to 30 miles an hour. With the top removed, and larger sprockets fitted to the countershaft, it forms a fast touring car, and will carry six or eight persons. This type is usually fitted with solid rubber tyres on the driving wheels and pneumatics on the front wheels, an arrangement which has proved itself thoroughly satisfactory. The Lonsdale wagonette has another type of body, which affords complete protection from the weather, but has not been designed for carrying as much luggage as the omnibus. Its hood can be raised and lowered in a few moments, and side doors are fitted between the dash and the driver's seat. It is shown in Fig. 1, with its hood folded down, and is a handsome-looking vehicle.

A partly finished chassis is seen in plan in Fig. 2. The main frame and the underframe are constructed of solid drawn steel having a rectangular cross-section. It is 1¾ inches wide and 2 inches deep, and is filled with wood. Ash is used for this purpose, and it is tightly driven into the lengths of steel tube. The main frame, A, is rectangular, and the underframe, A^1, passes from its front member to the cross-member just behind the side sprockets. The underframe is rendered rigid by tubular stays, A^2, and side brackets, A^3, all of which connect it to the main frame. These tubular members serve as effective tie-bars for preventing any twisting of the framework. The engine and change-speed-gear are fixed in much the usual positions with a main clutch between them on the underframe, and the differential countershaft lies across the frame, engaging with the flexible couplings, G, which connect it with the side sprockets, G^1. The brackets carrying the sprocket wheels are fixed to the side members of the main frame, and are connected with the rear axle by adjustable distance rods in the usual way. The suspension is provided for by semi-elliptic side springs fixed to the front and rear axles. Two side levers, D and E, operate the side brakes, D^1, and the change-speed-gear, respectively, the latter being connected with the gearing through the rod, E^1. The brake drums and sprocket wheels are secured to the spokes of the rear wheels in such a manner that a casing enclosing the chains can be fitted if desired. The side brakes are interconnected by the cross-shaft seen in Fig. 2, but are not provided with any compensating device. The rod which applies them passes along the right-hand side of the car from the lever, D, but is not shown in the illustration. The connecting shaft has a small lever arm fixed to it by which it is connected with the main clutch, so that when the emergency brakes are applied the clutch is withdrawn from engagement. The usual foot-pedals for operating the main clutch and the countershaft-brake are carried by a shaft which passes across the underframe between the brackets, F. The foot-brake is also arranged in such a manner that the clutch is disengaged when it is used. The steering-gear is of the worm and segment pattern, and is irreversible. The steering-pillar carrying the wheel is inclined, and the rods connecting it with the front wheels are of ample strength. The steering-heads for the wheels are supported both above and below by the forked ends of the axle; the arrangement of these parts is seen in Fig. 2. The small hand-levers which regulate the speed of the engine, by acting upon a throttle-valve and upon the commutator, are mounted horizontally above the steering-wheel, the one moving over the toothed quadrant, C, and the other being beneath it. The one is connected to a rod passing down the steering-pillar and the other to a tube passing down it. Both the rod and the tube are fitted with sleeves inside the pillar, and the motion is transmitted from the hand-levers through slots in the steering pillar by means of projecting parts and spiral ways in which they work.

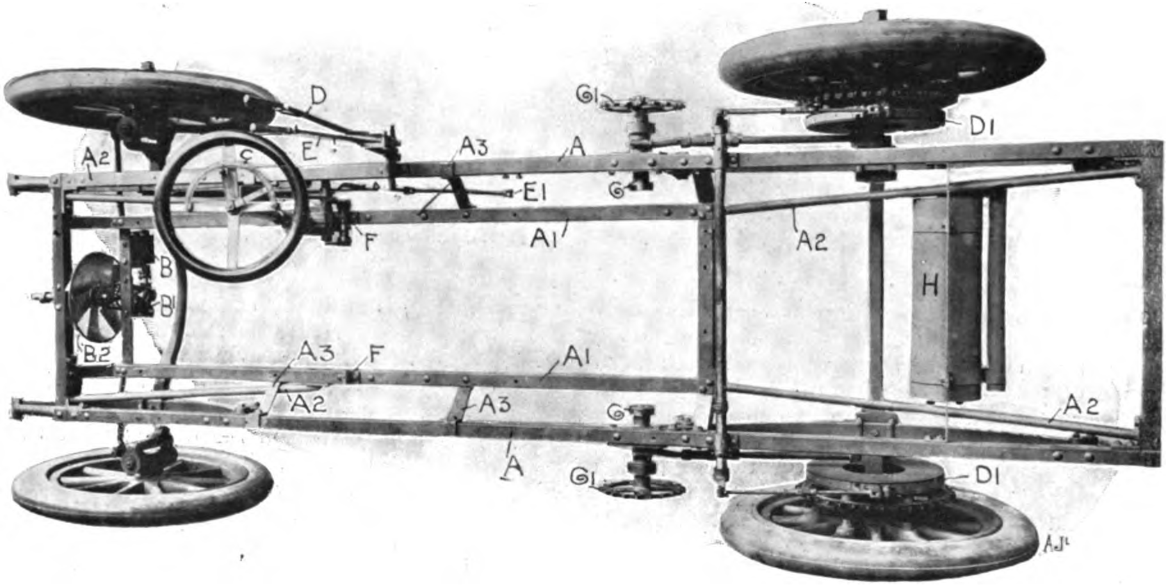


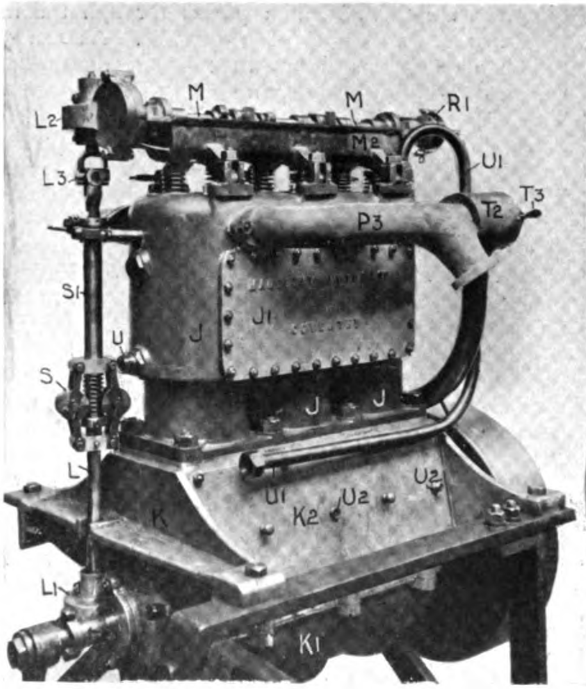
Fig. 2.—Plan View of partly-finished Chassis.

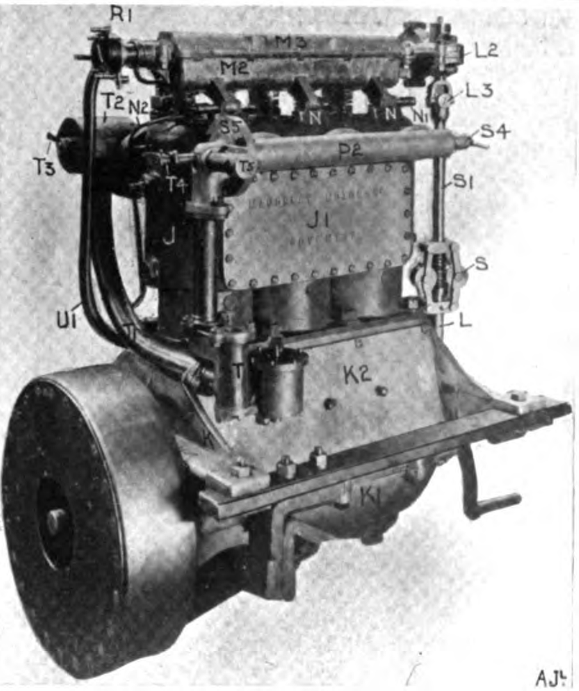
Neatly arranged lubricating and water circulating pumps, together with a fan, are fixed to a cross member of the underframe in front. The shaft driving these three parts engages with the front end of the crank-shaft through a flexible jaw coupling. The shaft carries a spiral gear-wheel which meshes with a corresponding wheel upon the common shaft of the two pumps. They are both of the gear-wheel type; the lubricating pump, B, circulates the oil through the bearings of the engine, and the water pump, B^1, forces the cooling water through the jackets of the cylinders and through the radiator in front. The fan, B^2, is driven by a chain, and is placed immediately behind a combined tank and radiator. The position of the exhaust box, H, behind the rear axle is also shown in Fig. 2.

The chief alterations which have been made in the engine are that the inlet valves, as well as the exhaust valves, are now arranged in the heads of the cylinders instead of to one side, and that they are mechanically operated in exactly the same manner as the exhaust valves. The three cylinders are also cast in one piece with their heads and jackets, instead of there being a joint between the cylinders and their heads. The accessibility of the valves is very noticeable, and the manner adopted for moving the cam-shaft out of the way is particularly ingenious.

The cylinders have a bore of 5 inches and the stroke is 5 inches. The normal engine speed is 800 revolutions per minute, and although the nominal h.p. is 20, yet even when fitted with atmospheric inlet valves, 31-b.h.p. has been obtained on the testing bench. The cranks are set at an angle of 120° from one another, and the cams are so arranged that the explosions occur at 240° from one another on the crank-shaft, giving one impulse at each two-thirds of a revolution.

The complete engine is seen from the exhaust pipe side in Fig. 3, and from the carburettor and governor side in Fig. 4. In this latter illustration part of the cams and the cam-shaft are seen. In Fig. 5 the cam-shaft is also exposed to view, and the casing containing it is hinged over out of the way of the valves. In this illustration, also,





THE 20-H.P. MAUDSLAY ENGINE.

FIG. 3.—Exhaust Pipe side, with Cams exposed.

FIG. 4.—Carburettor and Inlet Pipe side.

the gear-wheels driving it are seen, and the doors to the crank-chamber have been taken off. Fig. 6 shows the upper portion of the engine under similar circumstances, but on the opposite side.

The cylinder casting, J, is so made that the valves and the ignition plugs are received vertically from above. The inlet valves are marked P in our illustrations, the exhaust valves P¹, and the ignition plugs R. The valves are all arranged in line with one another, centrally with the cylinders. They are held down in place by specially-constructed nuts, which pass over the springs and screw down upon the seatings, making a joint between them and the main casting. To remove them a special box spanner is required, by means of which the nuts are screwed out,

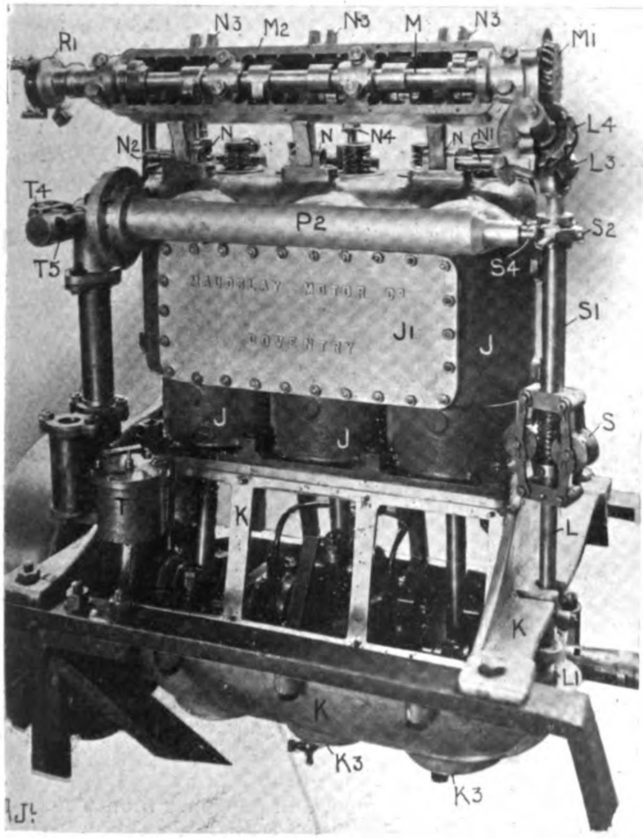


FIG. 5.—The Maudslay Engine, with Cam-Shaft hinged over and exposed to view. The covers to Crank-Chamber also removed.

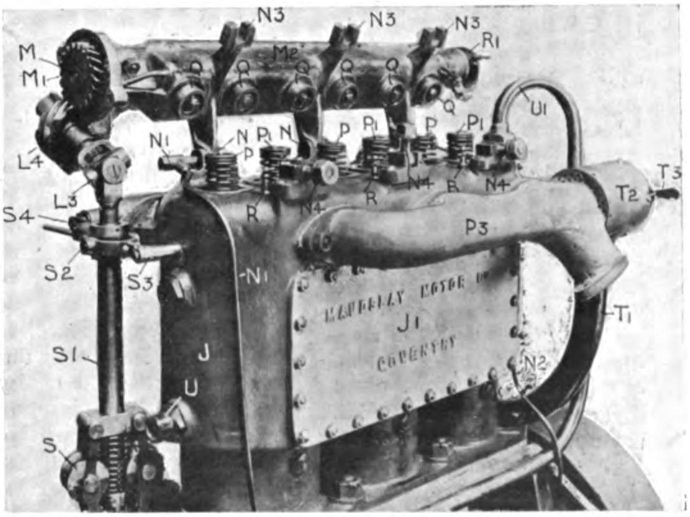


FIG. 6.—The Cylinder Heads from Exhaust Pipe side of Engine, showing Cam-Shaft hinged over.

and the valves, together with their seats, can be lifted up. The ports leading from the valves to the inlet and exhaust pipes, P^2 and P^3 respectively, are formed in the cylinder casting. A special tool is also required for unscrewing the ignition plugs, R, as they do not project far above the surface of the casting. The water jacket passes around the valves and the ports. Aluminium cover plates, J^1, are bolted to its sides, and form part of the walls of the jacket. The water enters the jacket low down at the forward end by the pipe fitting, U, and leaves at the top of the jacket by the pipe, U^1. The cam-shaft, M, which operates the valves is enclosed in a casing, M^2, which provides four bearings for it, and which has a removable cover, M^3. The casing, M^2, is hinged to the top of the cylinder casting by three hinges, N, and it is normally held down in place by three swinging bolts, N^4, fixed at the opposite side of the head, which engage with the slotted projecting feet, N^3, forming part of the casting, M^2. The hinges on the swinging bolts together hold the cam-shaft rigidly in place, but when the bolts, N^4, are removed, the entire casing can be rocked over out of the way of the valves. The casing, M^2, is so shaped that it forms machined-guide surfaces at each side of each of the cams for a sliding block to move up and down in. The block carries a hardened steel roller which engages with the cam, and the block is formed with a cylindrical portion, Q (Fig. 6), which projects through the lower portion of the casing. These sliding parts communicate the action of the cams to the valve-spindles, and the details of their construction have been very carefully considered in every respect. The cam-shaft and other moving parts in the casing, M^2, are lubricated through the pipe, N^1, which is connected to the hollow pin of the forward hinge, N. A hole is drilled from the hinge up into the casing, N^2, and in this way oil is forced into the cam-shaft chamber whenever the engine is running. It finds its way to all the bearings, and into the casing carrying the gear-wheels which drive its shaft. The oil is led out through the rearmost hinge, N, in a similar manner through the pipe, N^2.

The cam-shaft is connected with the crank-shaft by a vertical shaft, L, having spiral gear-wheels at each end. It is driven by a pair of wheels contained in the casing, L^1, and revolves at the same speed as the crank-shaft. It is placed in line with the axis of the hinges, N, and is fitted with a universal joint, L^3, in line with them. The universal joint, L^3, therefore forms a hinge for the shaft, and since it is in line with the other hinges, N, it allows the casing, M^2, to be moved into the position shown in Figs. 5 and 6. The upper portion of the vertical shaft carries the gear-wheel, L^4, which meshes with a corresponding wheel, M^1, having twice as many teeth, which is fixed on the cam-shaft, M. The two wheels, L^4 and M^1, are enclosed in a neat casing, L^2.

The commutator, R^1, is usually fixed on the dashboard of the car, but at the time we took our photographs the engine was fixed upon its testing bench, and the commutator was for convenience fitted direct upon the cam-shaft. This end of the cam-shaft is, as a rule, provided with a flexible coupling which engages with the short shaft of the commutator, but does not prevent the cam-shaft from being rocked over out of the way, and does not necessitate the removal of any parts of the commutator. The ordinary high-tension ignition is employed, three coils with their tremblers being used.

A centrifugal governor, S, is fitted upon the vertical shaft, L, and is connected by the sleeve, S^1, with the forked lever, S^2. This lever is fulcrumed to the cylinder casting at S^3, and is at its other end connected with a small crank-pin on a spindle, S^2, which passes through the induction pipe fitting, P^2, to a throttle valve, S^5. As the speed of the engine increases the governor balls fly outwards, drawing the sleeve, S^1, downwards, and so closing the throttle valve. The carburettor, T, is of the float feed spray type, and it takes its warm air supply through the pipe, T^1, from a chamber, T^2, arranged about the exhaust pipe fitting, P^3. This chamber is provided with an adjustable disc valve, T^3, by which the temperature of the air can be regulated by allowing more or less cold air to enter through it. The mixture supply pipe from the carburettor leads up to a fitting which contains a hand-regulated throttle valve, T^4, and an auxiliary air regulator, T^5.

The crank-chamber is made of aluminium in two pieces, the joint between which passes through the main bearings. The lower portion, K^1, has three coverplates underneath each of the cylinders, any of which can be removed in much the same way that a manhole is opened in a boiler. The upper portion, K, provides projecting feet by which the engine is fixed to the underframe of the car, and it is closed in at each side by removable coverplates, K^2. The connecting-rods and crank-shafts are by this construction very ready of access and can be thoroughly inspected by merely removing the plates K^2, (as in Fig. 5). The crank-shaft is supported in large bearings at each end, and also has bearings between each of the cranks. The cylinder casting is securely bolted to the top of the crank-chamber, and since it is made in one piece, it allows the upper part of the chamber to be very light, except at each end. The crank-shaft is forged out of the solid and is hollow; it and the other moving parts in the crank-chamber are lubricated through pipes which lead into the caps of the two inner bearings. The oil is forced from these through the crank-shaft, the crank-cheeks, and the crank-pins to the connecting-rods. The connecting-rods are also hollow and the oil is forced up through them to hollow gudgeon pins in the piston, through which it is sprayed on to the cylinder walls. The oil ultimately finds its way back again to the crank-chamber, from where it is drawn by the pump, B, already referred to, through a filter. The oil pipes leading to the crank-shaft are led in through pipe fittings, U^2, in the coverplate, K^2.

It will be noticed in Fig. 4 that the flywheel is fitted with a metal disc which prevents the conical clutch surface formed inside it from being seen. This disc enables it to be partly filled with water, so that the flywheel can be kept comparatively cool whilst the brake-horse-power tests of the engine are being made.

The main clutch is well designed and is of large size. It is normally held in engagement by an external spring, the strength of which can be adjusted, and the parts of the clutch are so arranged that there is no end-thrust on the shafts when it is in use; the thrust is taken by a ball bearing when it is held out of engagement. The portion which is surrounded by the spring forms part of a flexible coupling for a short shaft which connects the clutch with the first-motion shaft of the change-speed gear, and a universal joint is fitted between the other end of the short shaft and the first-motion shaft. The flexible coupling allows for free longitudinal movement besides preventing any side strains from being imposed upon any of the bearings. Its guiding surfaces are carefully designed, and phosphor bronze blocks are employed.

The change-speed gear is shown in Fig. 7, in which the top cover is removed, as also is the upper portion of the cover surrounding the cam-plate, X. The first-motion shaft lies immediately beneath the second-motion shaft, V, and carries two pairs of sliding gear-wheels, which are mounted upon a square portion of that shaft. The second-motion shaft has four fixed wheels mounted upon it, the largest of which, V^1, is close up to the bevel wheel, V^5, which drives the differential gear, Y, through the bevel wheel, Y^1. The main bearings for both shafts are made in such a way that roller bearings can be used if desired, but solid brass bushes are usually fitted instead. One bearing of the second-motion shaft is arranged just in front of the large wheel, V^1, which is the first-speed wheel. A ball-thrust-bearing is fitted at the forward end of the first-motion shaft, and another is provided behind the bevel wheel, Y^1, on the differential gear. The second and third-speed wheels, V^2 and V^3, are seen in Fig. 7, but the smallest spur wheel on the same shaft which gives the top speed, is hidden behind the wheel, V^2. The sliding gear-wheels on the first-motion shaft are brought into engagement as required by means of the cam plate, X, which is caused to revolve by means of a toothed quadrant engaging with the spur wheel, X^1, fixed to it. The quadrant is carried on a fulcrum pin in the cover of the gear-box, and is connected with the change-speed lever. When the lever is moved forwards or backwards it causes the cam plate, X, to rotate.

The cam-plate is clearly seen in Fig 8, and the sliding forks, Z, which move the gear-wheels in and out of mesh, are shown in the same illustration. The groove, X^3, in the cam-plate engages with the rollers, Z^1, and these communicate the sliding movement imparted to them by the cam to the first and second and to the third and fourth forward gear-wheels alternately. The forks, Z, and the rollers, Z^1, are fixed to guide pieces which slide on the bar, Z^3. This bar is also capable of sliding longitudinally, and its roller, Z^2, rides in the cam path, X^4. When the bar is caused to slide, its fork, Z^4, slides an intermediate spur-wheel into mesh with a fixed wheel on the first-motion shaft and with the large gear wheel, V^1, on the second-motion shaft. The intermediate "reverse" wheel is normally out of mesh with the wheels on both shafts. The change-speed lever, E (Fig. 2), moves over a quadrant which is marked to indicate its various positions, but it has no notches in it. The small catch-lever on the hand-lever, however, is connected by a Bowden wire with a sliding stop passing through the wall of the gear-box and engaging with large holes, X^1, drilled in the periphery of the cam plate, X. The stop holds the cam plate in either of the working positions and ensures that the gear-wheels shall be properly in mesh with one another. We understand that the catch may be made to engage with holes in the steel plate forming part of the cam, instead of on the periphery, in future; this being done for the sake of lightness.

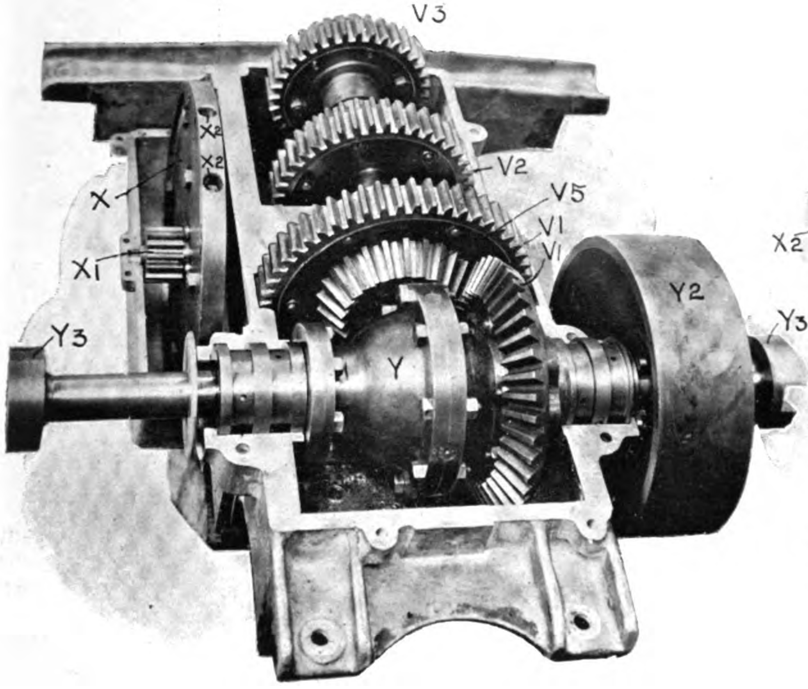


Fig. 7.—View of gear-box with top cover removed and cam-plate exposed.

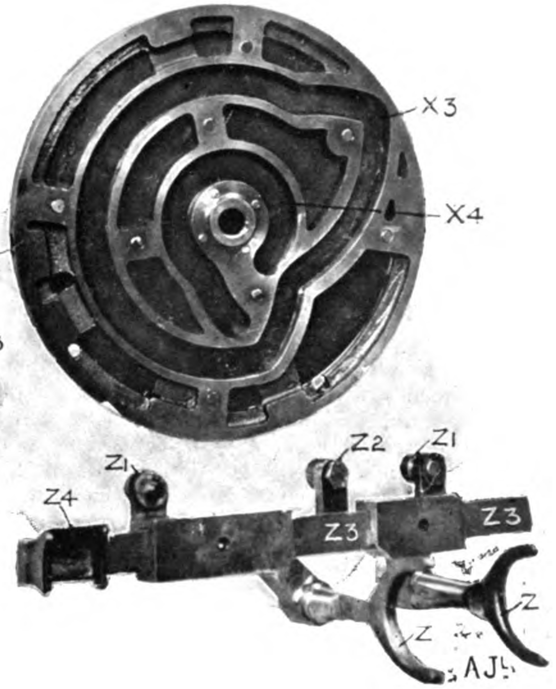


Fig. 8.—The cam-plate and sliding parts operating change-speed gear.

The differential countershaft is fitted with a large hollow brake-drum, Y^2, and provision is made on the car by which the driver can allow water to flow into it and thus keep it from getting too hot. The ends of the countershaft are provided with jaw couplings members, Y^3, which fit into the corresponding coupling blocks, G (Fig. 2), already referred to. The differential gear itself has four planetary bevel wheels. The gear-wheels throughout the gear-box are made of special steel, and are hardened. The teeth are of large size, and they are of ample width.

Oil is circulated round the gear-box bearings by a small pump which is fitted on the rear end of the first-motion shaft.

All three brakes are double-acting, and are amply large for their purpose. The brake lever, D, is provided with a toothed quadrant so that it can be left in its "on" position when the car is standing.

We understand that the Company will turn out about 30 cars this year, and we have little hesitation in saying that they will find no difficulty in securing customers for all these—and for more, if they could supply them.

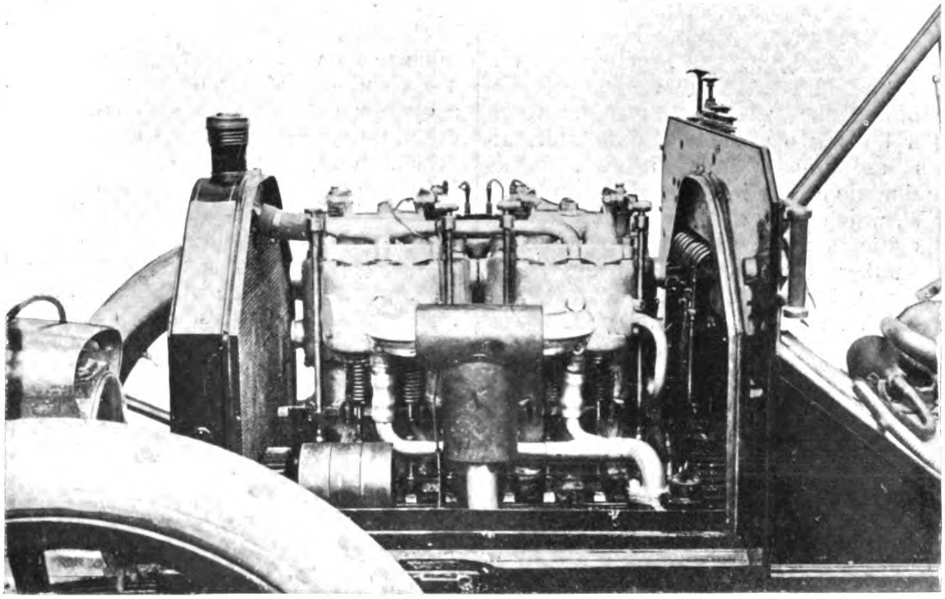


FIG. 1.—The engine in position in Mercedes Car.—Exhaust valve side.

THE 1903 18-22-H.P. MERCEDES.

WE have already given some details concerning the new 1903 Mercedes car. In our issue of January 24th we were able to describe and illustrate the change-speed gear and the main clutch of the 18-22-h.p. vehicle and to reproduce a photograph of a pair of the cylinders used on its 4-cylinder motor. A view of the complete car was also shown in our frontispiece on February 14th, and we then added a few details concerning it. The accompanying illustrations show further features of this interesting machine.

In Fig. 1 the method employed for operating the inlet valves is clearly shown; it will be remembered that they fit into the heads of the cylinders. Vertical rods are used for connecting the lifting movement of the cams to small pivoted levers, which act upon the ends of the valve spindles. In the same illustration it will be noticed that the exhaust ports from each pair of cylinders are connected

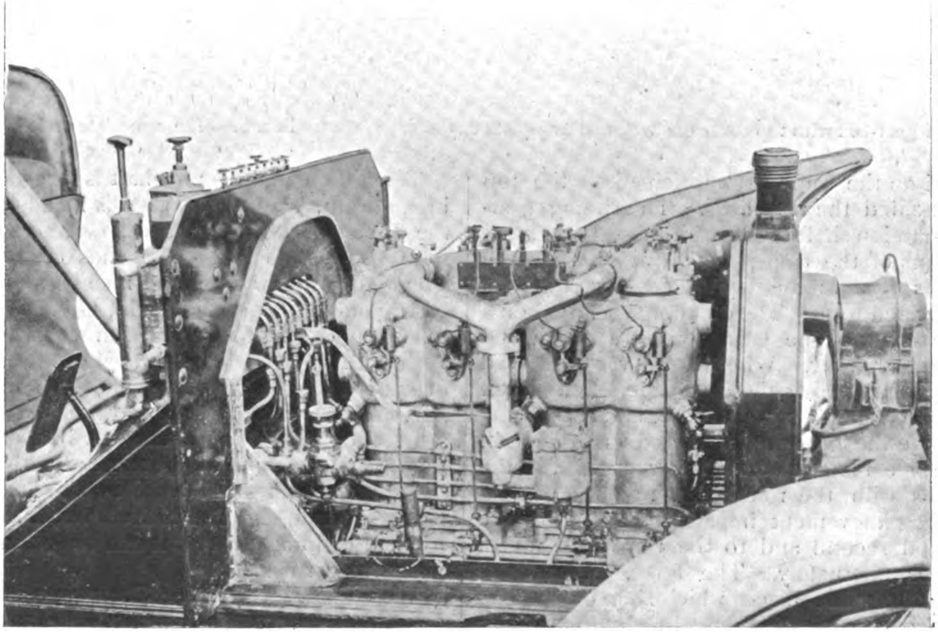


FIG. 2.—The Mercedes engine in position.—Carburettor side.

together in the cylinder casting itself, and that the exhaust pipe forks to each pair of cylinders. The exhaust valves are arranged in the usual manner with inspection covers above them. The magneto, which is gear-driven, is arranged on the same side of the engine as the exhaust valves.

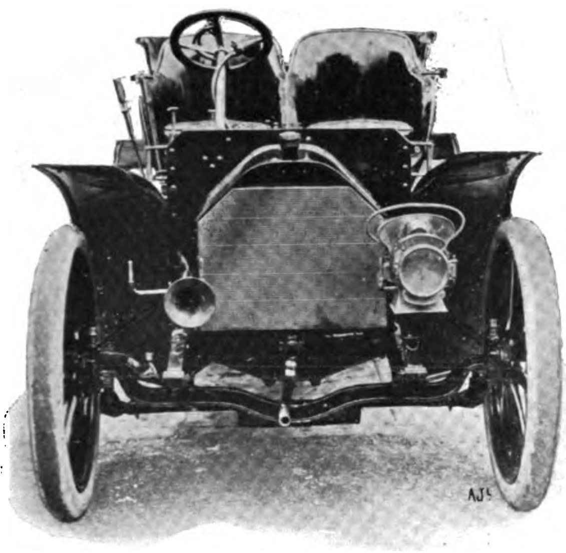


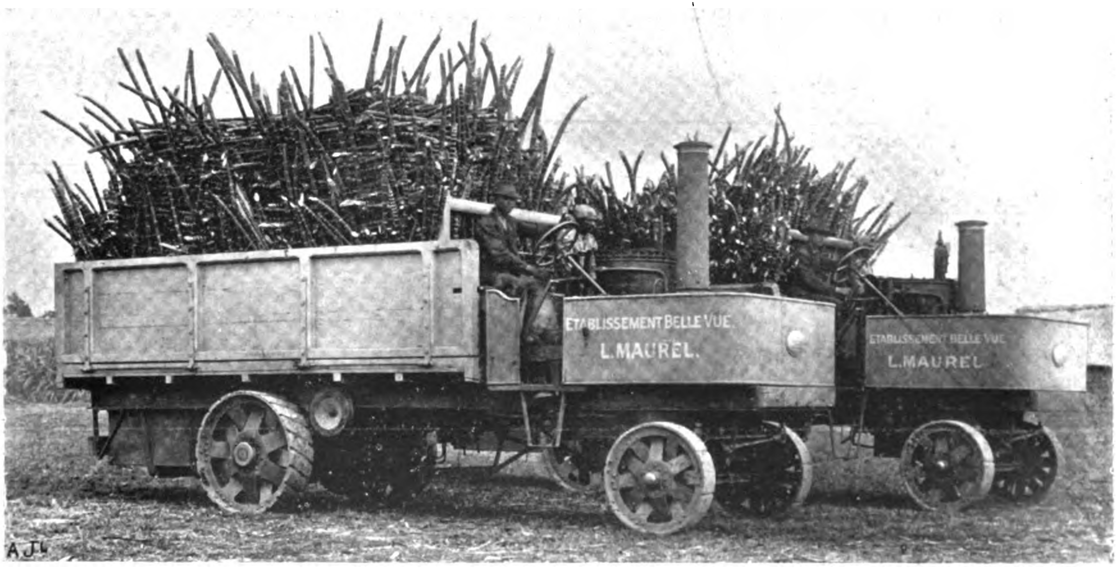
FIG. 3.—Front View of 18-22-h.p. Mercedes Car—1903 Type.

In Fig. 2 the low-tension igniters are prominent, and it will be noticed that they are operated from a special cam-shaft which is driven by gear wheels from the crank-shaft. The wires leading to these igniters are connected at their other ends to terminals fixed upon a block of insulating material placed between the cylinder castings.

Fig. 3 is a front view of the complete car.

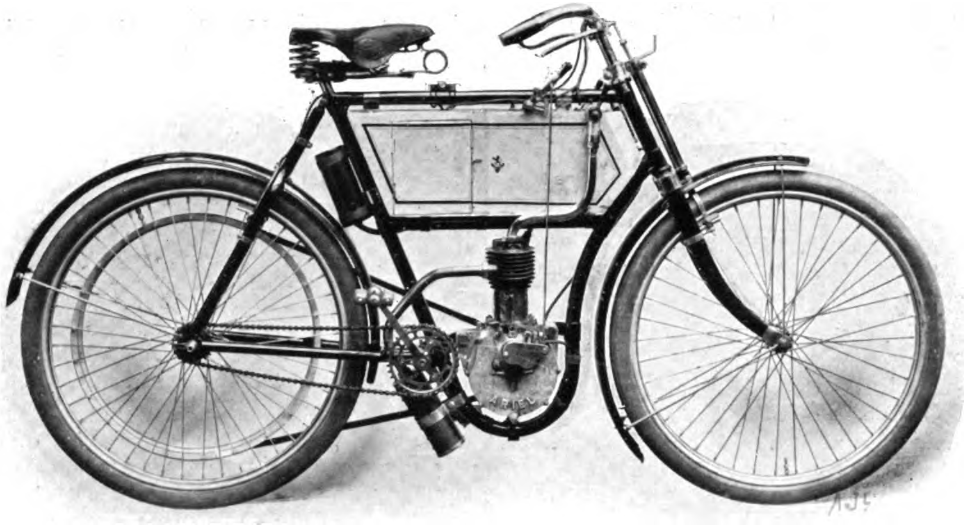
INDUSTRIAL AUTOMOBILES IN THE COLONIES.

THE automobile movement is assisting progress everywhere, and, not least, in comparatively out of the way places where traction and transport difficulties have hitherto seriously impeded commercial and economic development. Thus we learn from a Mauritius journal that the Thornycroft steam lurry has been introduced into the island, and that a number of them are at present engaged there doing excellent service for the planters. Some five in all of these vehicles are in use, and, according to the *Journal de Maurice*, one of the principal difficulties which have hitherto confronted the planters of the island is by their means being thoroughly overcome, horse traction being at a great discount owing to the effect of the climate on the animals. Our illustration shows a pair of the Thornycroft lurries heavily laden, as may be observed, with sugar-cane. They correspond in every respect with the other lurries, all of them being of 6-ton capacity and resembling the usual Thornycroft vehicles with which the British public is familiar. Of course they transport other things beside sugar canes, and two of them are continually engaged carrying bags of sugar from the factory to the docks at Port Louis for shipment, a distance of 15 miles. The lurries are the property of Mr. L. Maurel, of the Belle Vue Estate. They are all working regularly, some of them doing as much as 40 miles per day with full load, no trouble of any kind being experienced with them. The municipality of Singapore is also in possession of a standard Thornycroft tip wagon capable of dealing with a load of 3½ tons, the machine itself weighing 2½ tons. It is designed in addition to haul a trailer with a load of 1½ tons, but as a matter of fact on the flat it easily deals with two of these so that its actual carrying capacity is between 6 and 7 tons. This tip wagon has been running every day except Sundays since last June, and has shifted upwards of 3,000 tons of material and run upwards of 2,000 miles.



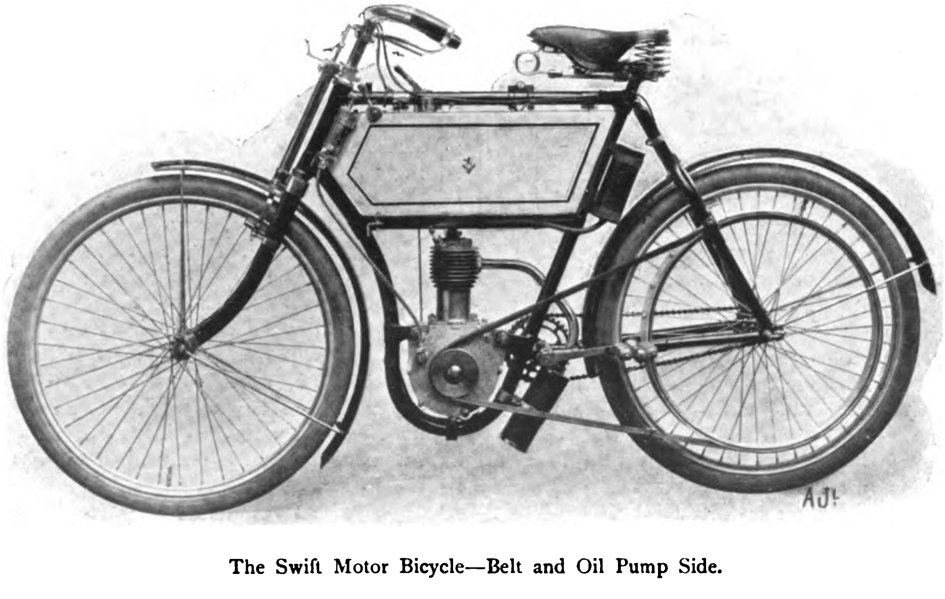
A Pair of Thornycroft's Lurries in Mauritius laden with Sugar Canes.

THE SWIFT MOTOR BICYCLE.



The Swift Motor Bicycle—Chain and Contact Breaker Side.

THE accompanying illustrations show the new bicycle which the Swift Cycle Company, of Coventry, are putting upon the market. It is a particularly strong machine and one in which simplicity of construction, combined with good workmanship, are the leading characteristics. In general respects it does not differ materially from a large number of other bicycles now on the market. A Lincona belt is used for transmitting the power from the motor to the rear wheel, and the ordinary foot-pedalling chain drive is provided. The frame loops round the crank chamber of the motor, and is fixed to it at three points, suitable lugs being brazed to the frame for this purpose. The frame has two horizontal tubes between which the tanks, battery, and the coil are carried in a neat case. The head is of the duplex pattern, in which a second tube, stiffening it considerably, is fixed in front of the ordinary head tube. The rod leading down to the rim brake on front wheel passes through this tube. The motor employed is one of the latest 2-h.p. Ariel, which is already well-known to our readers, and is one of the best made of its type now on the market. It is fixed in a vertical position, and the bottom bracket lies just behind it. The centre of gravity has been kept as low as possible, and the various parts of the engine are conveniently situated for inspection. A surface carburettor is used, and the richness of the mixture is regulated in the usual manner by two small levers. A larger lever just behind them is connected with contact maker-and-breaker, and with the exhaust valve lifter. The inter-connection between these two parts is such that the latter is brought into operation after the time of ignition

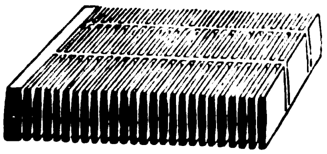


The Swift Motor Bicycle—Belt and Oil Pump Side.

has been retarded to its full extent. The contact-maker is of substantial design. Its cam is so shaped as to give a very quick "break," and the contact spring is brought by it into positive contact with its platinum-tipped screw. The primary circuit to the coil is thus made and broken once at every revolution of the cam. The accumulators have a capacity of 12 a.h. The two cells forming the battery are said to be sufficient for running about 500 miles without re-charging. A small hand-pump is fitted for measuring and forcing a charge of lubricating oil into the crank chamber, and this operation can be performed whilst the machine is in use. A safety plug is fitted upon the top tube, beneath the front of the saddle; removing the plug disconnects the electric circuit from the battery.

The front wheel rim brake, and a similar brake operated by a Bowden wire on the back wheel, ensure ample safety in this important respect. Wide mud-guards, the front one of which is extended forward from the forks, are fitted, and the Swift pattern free wheel is provided for the pedalling gear. The wheels are 28 inches in diameter, and are fitted with 2-inch by 2-inch Dunlop tyres. The usual handle switch for disconnecting the ignition and thus instantly stopping the engine is supplied. Special care has been taken to carry all pipes and wires neatly from place to place. As we have already said, strength and simplicity are the chief features of this bicycle, and it can confidently be recommended as a safe and reliable machine.

THE HAGEN "ALL THROUGH" GRID.



The accompanying illustration shows the present type of positive plate employed by the Hagen Accumulator Company. As our readers are doubtless aware, the Hagen Company have hitherto employed a ribbed positive plate, in which the ribs form projections from the plate surface. The present form of plate belongs to what is known as the "all through" type, that is to say, the ribs or laminations are only connected by vertical stays, and on holding the plate up to the light a clear space right through, between the laminations, is observable. Other accumulator constructors have been aware of the increased capacity obtained by this form of plate. It is interesting to find the Hagen Company in this respect adopting the practice of other makers.

Particulars have been sent us of a new and rapid process for seasoning and vulcanising timber, which, according to the results given, has the effect of enabling even soft wood to be seasoned in twenty-four hours, and of increasing its toughness, its weight, and its imperviousness to moisture. The Powell process consists in first saturating it at boiling temperature with a solution of common refined sugar. The water is afterwards evaporated out at a high temperature, and the interstices of the wood are then found to be filled with solid matter, the timber being vulcanised, preserved, and seasoned. We understand that further particulars will soon be given publicly of this invention, which may be found useful in motor vehicle construction.

REVIEWS OF BOOKS.

"Motor Cars, and the Application of Mechanical Power to Road Vehicles," by Rhys Jenkins, M.I.M.E. (T. Fisher Unwin, Paternoster Square, London.)

This is an exceedingly interesting, well got up, and really beautifully illustrated treatise. It is the kind of book that ought to have a very wide sale among those interested in the automobile movement, and is just the kind of work for the cultured motorist to display on his library table. To avoid misunderstanding and possible disappointment amongst purchasers, it would be well, however, to make it clearly understood what the nature of the book is. It is not a technical treatise on all the different motor cars of the present day, although these are mentioned and succinctly described. It is pre-eminently what its title describes it to be—a book about the application of mechanical power to road traction, and, we might add, more particularly in the past. At any rate, practically half the book is taken up with what one might almost call the archæology of the motor car, and wonderfully interesting reading it is for those who want to get a clear view of previous attempts to replace animal traction by mechanical power. The author sets his net rather wide, and includes in his purview carriages propelled by animal power, in which the animals were put inside the carriage instead of outside—the animals including men. Of course, these things were all fakes, and were really only designed to produce a mysterious effect, as in the processions mentioned by Heliodorus, and in the case of the wonderfully ornate Nürnberg carriage of 1649, which was presumably propelled by men turning winches concealed inside it. At any rate, it was sufficiently advanced to warn passengers of its approach by hooters held by carved angels on either side of it. Dealing with carriages propelled by the wind, it is distinctly surprising to learn that the first real sailing yacht went gaily before the wind across the sands of the Dutch coast, about the year 1600. And then we come to the dawn of the steam carriage, and few people probably are aware how early this dawn took place. The author attributes the first steam carriage to the great French Jesuit Verbiest, who was one of the founders of the Pekin Observatory, the instruments of which were recently raided by the Germans and carried off to Berlin. His carriage is described as having been propelled by something in the way of an eolipile, the invention of which was attributed to Hero of Alexandria, and was a kind of (probably imperfect) Laval turbine. We then encounter an excellent illustration of Cugnot's steam carriage, which was apparently the first steam vehicle that actually moved in Europe. The early steam carriages of the first part of the nineteenth century, and of what is appropriately termed in the book "the steam carriage boom," are all well illustrated and succinctly described, though some of them either did not run on roads at all, or, if they did, only traversed a few miles. It would have, perhaps, been well if the distinction between those which were practically successful to a certain extent, and those which remained only more or less completely incarnated projects, had been made more clear. The great thing is that the work does full justice, at great length and with very complete and attractive illustrations, to the really great development that the steam car attained between the years 1820 and 1840, and enables, better than any work we have yet seen dealing with the subject from the present day point of view, the great ingenuity and real genius of these early constructors to be fully realised. But Mr. Jenkins' explanation of why the movement came to nought does not appear to us to be at all adequate. We have repeatedly explained in the pages of the Journal that the main cause of the demise of the early steam vehicle was the exorbitant tolls levied upon it, which popular prejudice did nothing to abate, but rather encouraged. Another difficulty was doubtless caused by the vibration of the iron-tyred wheels. Speeds, even approaching the legal limit, have only been rendered possible, without very rapid destruction of the machinery, by the indiarubber tyre. It was its non-existence rather than the imperfections of the engine to which the author, and we think unjustly, attributes it, that was the real cause of the collapse of the "steam carriage boom." It is interesting, by the way, to note that one of these early vehicles endeavoured to get over the trouble by the employment of spring wheels in which the spokes were capable of a certain amount of "give."

Mr. Rhys Jenkins devotes an important chapter to what he terms the modern revival, which gives in a succinct form, with tolerably copious illustrations, the principal events which took place between the year 1880 and the passage of the Act of 1896. The period between the collapse of the steam carriage boom and this modern revival is covered by a chapter dealing with the more or less satisfactory attempts to employ compressed air for the propulsion of carriages, and the unwieldy steam vehicles which were designed between the years 1858 and 1881. In connection with the application of compressed air to automobilism, the precocity of the inventor, Wellman Wright, is well illustrated. He was the first to propose and employ the heating of compressed air when in use, the method of working which has given such satisfaction on the Nantes compressed air tramways.

The rest of the work deals with modern petrol cars, one chapter being devoted to English cars and another to foreign vehicles. There are also chapters on steam and electric carriages, motor wagons and vans, and motor cycles. As all the English-built petrol cars of any note are dealt with in one chapter, and a good many of them illustrated, it naturally follows that the descriptions are very short, and we really think it would have been better to give more exhaustive accounts of one or two leading cars. However, considering the general scope of the work, there is something to be said for the line adopted; it is, after all, more in the nature of a history of the movement, than a detailed technical work. The leading foreign petrol cars, both Continental and American, are also all crammed into one chapter, and suffer from excessive "compression" in consequence. The chapter on steam vehicles and electric cars is really quite inadequate. The Gardner-Serpollet system is dismissed in four pages, including illustrations, though perhaps we ought not to say too much about that, as the note appended makes amends for much. It runs as follows:—"The construction of the Gardner-Serpollet cars will be found described in great detail in a fully-illustrated series of articles in The Automotor Journal for June and July, 1902." We append the description of the White car as a model of the way in which too much condensation can become almost ludicrous. "The White car has a 'flash' boiler consisting of a coiled tube; the water is supplied at the top, and the steam escapes at the bottom. The fuel supply is regulated by a thermostat, according to the temperature of the steam, and the water supply by a diaphragm regulator according to the pressure in the boiler." This reminds us forcibly of the old joke about the classical scholar who was asked to describe the common pump, of which he furnished an illustration, and explained that "a power, P, applied to the handle, H, caused the water, W, to issue from the spout, S." Of course, the same impossibility of dealing with a subject in a single chapter renders the treatment of motor wagons and vans, electric carriages and motor bicycles, very inadequate, though this applies less to the latter subject than the two former, as the general principles of construction of several motor bicycles are well illustrated and explained.

As already indicated, the work is a history and chronicle of self-propelled traffic—and a singularly complete, interesting, and well illustrated history it is. To attempt to deal with the subject in technical detail at the same time would have been a mistake, would have made the work unwieldy, and would have been mixing up two subjects which are better kept distinct.

Fuel Consumption on Locomobiles.—Referring to the article which we published describing the latest Locomobile models, the Company ask us to point out that the fuel consumption of their new 10-h.p. model was incorrectly stated by them to us. We understand that the 9 gallons carried in the petrol tank is sufficient for a run of about 90 miles—not 55 miles, as we were before told. The question of fuel consumption on light steam cars is one upon which reliable data have been difficult to obtain, and it is therefore interesting to notice that, in a recent trial made by an independent consulting engineer, the cost of fuel per mile on a two-seated Locomobile worked out at ·84 pence, taking petrol at 1*s.* per gallon. This result was obtained over a 50-mile run, the actual consumption being 3½ gallons.

Acute as the speed question is in Great Britain, automobilists have something to be thankful for in not being harassed to the same extent as citizens in the "land of the free." Each of the United States has power to make its own regulations in regard to speed, and at present there are some two dozen automobile bills and amendments being brought forward by the authorities of various States. One gentle individual, by name Scovel, a member of the New Jersey Legislature, is endeavouring to get his views legalised, which include a fixed arbitrary rate of speed, the treatment as a criminal liable to arrest and incarceration in jail of any person exceeding such speed, whether unintentionally or unknowingly, such arrest being possible at any time after the alleged offence and complaint made by anyone. Punishment by fine or imprisonment is unlimited. Another person of the name of Warren, who hails from Connecticut, in addition to holding that it should be legal for the automobilist to be "potted" by means of the rifle, would limit the maximum speed to 8 miles an hour, any violation being followed by a fine of $300 or 30 days' imprisonment, or both. Representative Lyon, of Lake County, desires to introduce a system for Chicago automobilists whereby a collision between an automobile and any other vehicle shall be presumptive evidence that the motorist was exceeding the legal speed limit, and that the burden of proof should, therefore, be upon the automobilist to show his innocence. It is hardly possible to believe, but, as a fact, this latter provision has actually been passed in its preliminary stages through the House of Representatives at Springfield.

THE FLEUSS AUTOMATIC BOILER REGULATOR.

WE referred briefly to the Fleuss automatic water regulator for steam boilers in our description of the exhibits at the Earl's Court Show, recently, and we now give illustrations from which its action will be apparent. The general arrangement of the parts is shown in the photographic reproduction, Fig. 1, taken by ourselves from the model shown on the Syndicate's stall. The boiler is here represented by a vertical tank, A, provided with a water gauge, A^1. The lower portion of the tank, W, represents the water space, and the upper part, S, the steam space. The apparatus consists of a mechanically-operated measuring device, R, which is shown sectionally in Fig. 2, and of a relief valve, V, which is shown in section in Fig. 3. The measuring device, and the ordinary force-pump, P, are connected to a pivoted lever, E^1, which is caused to oscillate by a link connecting it with a crank-pin on the engine-shaft, E. The pump takes its supply of water through the pipe, P^1, from the supply tank, T, and delivers it through the pipe, P^2, to a T fitting connected on the one hand through V^3 to the regulator, and on the other hand by the pipe, V^1, to the relief valve. The regulator consists of a cylindrical casting having upper and lower compartments, R^4 and R^3 respectively, as shown in the section. The reciprocating rod, R^1, is reduced in diameter at R^2, and the annular space thus formed between it and the containing casting alternately opens into the upper space, R^4, and into the lower, R^3. The feed-pump normally delivers the water through V^3 into the upper space, R^4, and it is then delivered into the annular space around R^2. The plunger, R^1, travelling downward, takes a certain quantity of water with it into the lower space, R^3. This lower space is connected with the bottom of the boiler by the pipe, W^1, and it is also connected with the steam space in the boiler by the pipe, S^1. So long as the level of the water in the boiler, and, therefore, in the space, R^3, is below the connecting neck surrounding the plunger, the water thus taken down will flow into R^3, and therefore into the boiler. If, however, the water level is above this, no additional water can flow into R^3, and the water returns with the plunger to the upper space, R^4. Under these conditions the water delivered by the pump flows through the pipe, V^1, into the relief valve, V. The stuffing boxes round the plunger, R^1, are provided with springs (as shown) and prevent the water or steam from leaking past the rod. The relief valve consists of a cylindrical vessel, into one end of which leads the pipe, V^1, and out of the other end of which passes the pipe, V^2, back to the supply tank, T. Both these pipes project a certain distance inside the chamber, and they are connected together by an india-rubber tube which is flattened at its centre. The rubber tube is normally prevented from allowing the water to flow through it by the pressure of steam surrounding it, the vessel being connected with the top of the boiler by the pipe, S^2, and the boiler pressure being in this manner caused to close the valve, V^4; the force exerted upon it is, therefore, proportional to the pressure in the regulator, R. It will, of course, be understood that the level of water which is automatically maintained in the boiler depends upon the relative height at which the regulator itself is fixed.

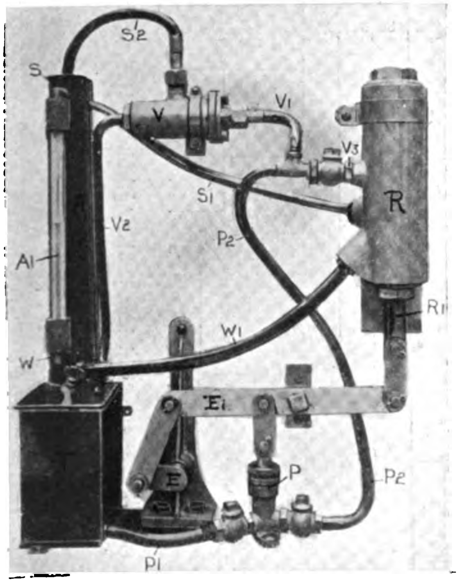


Fig. 1.

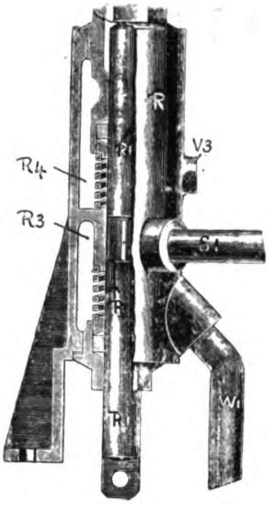


Fig. 2.

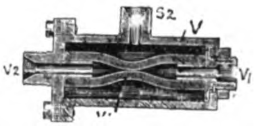
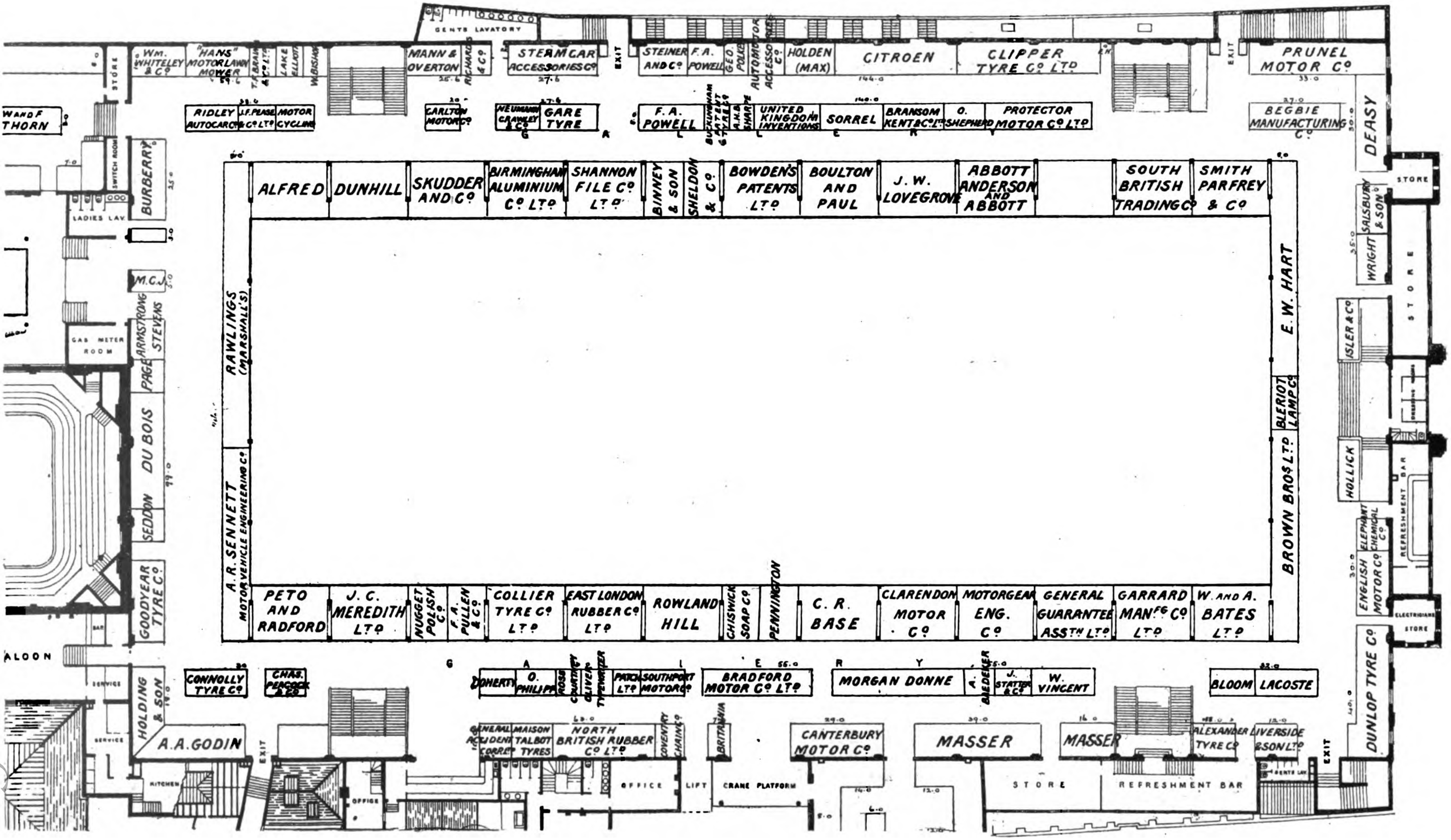


Fig. 3.

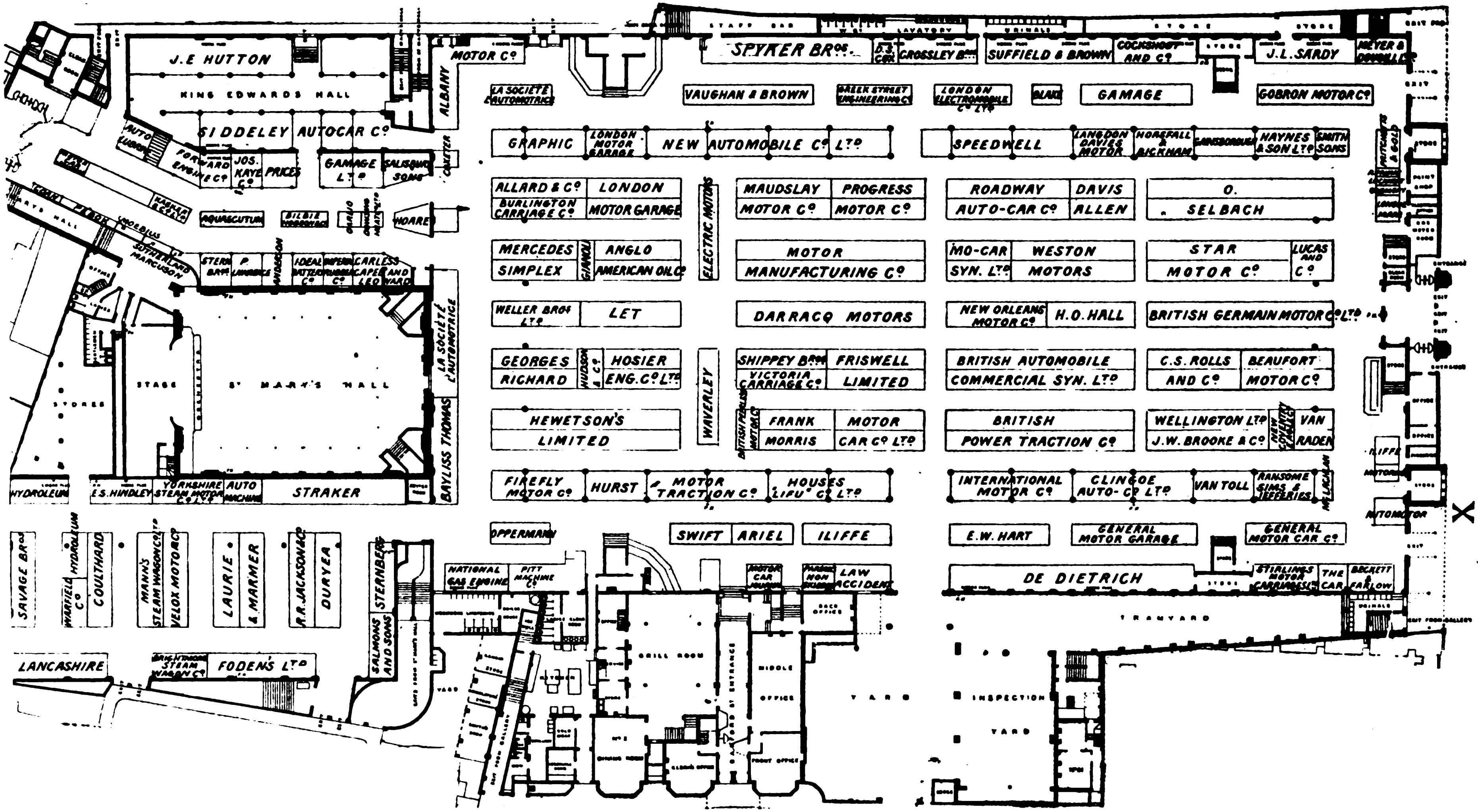
The device is being put on the market by the Fleuss Syndicate, of 15, Bury Street, St. Mary Axe, E.C.

* * *

THE Automobile Club of South Africa celebrated their first anniversary last month, when a distinguished gathering of members and guests supported Mr. A. T. Hennessy, the Vice-President. Amongst those assisting at this pleasant function were Sir John Buchanan, Sir David Gill, K.C.B., Sir Lewis Michell, M.L.A., the Hon. J. Garlick, M.L.C., Colonel Robinson, Mr. W. Thorne, the Mayor of Cape Town, Mr. Rudyard Kipling, Mr. A. C. Fuller (Hon. Secretary), &c., &c. Mr. Rudyard Kipling during the evening made a characteristic speech in replying to the toast of the parent Club (the A.C.G.B.I.). Greeting his fellow guests as "my brethern" Mr. Kipling said it was a pleasant thing there to find motorists treated as human beings. Where he came from they were looked upon as pariahs playing at a cross between pitch-and-toss and manslaughter, so that it was a pleasing thing to find motorists in evening dress, at a nice table, without having to hold one's hands in the conventional warning attitude. When the motor car was loathed throughout Great Britain the speaker was an ardent pioneer, and he went through many agonies, not pleasant at the time. Things were now changed, thanks to the Automobile Club. In South Africa a special kind of motor car was needed—absolutely dust proof, capable of being driven by a Kaffir with a screw-driver, wheels to go over six feet boulders, and ignition up in the air to allow for crossing drifts. He submitted this fact to the club's intelligence. All the advice he had to offer on this momentous occasion, on which, by-the-way, rested the future of automobilism in South Africa, was this, that when a motorist happened to run over a dog he should never pay more than £1 for it. Otherwise, this spelled black death, ruin and destruction; they would soon become bankrupt and intellectually dead.



Gallery Plan of Messrs. Cordingley and Co.'s Automobile Exhibition at the Agricultural Hall, open from March 21st to 28th.



Ground Floor Plan of Messrs. Cordingley and Co.'s Automobile Exhibition at the Agricultural Hall, open from March 21st to 28th.

THE AUTOMOTOR JOURNAL Stand (No. 76) is at the top of the Hall, where the X appears.

THE NUMBERING PROPOSAL.

A PROTRACTED discussion was held at the Automobile Club, on the 6th instant, upon the proposed legislative measures embodied in the Bill which has been placed by the Club Committee in the hands of the Hon. John Scott Montagu. Eighty-one members were present out of the total membership of 2,263. Mr. Roger W. Wallace, K.C., occupied the Chair, and at the outset mentioned the Gordon-Bennett Race Bill, of which it was hoped Lord Londonderry would be induced to take charge in the House of Lords, and which it was anticipated would be carried through without opposition.

Coming to the legislative question, for which the meeting had been convened, he pointed out that in the Bill, for which Mr. Montagu was nominally responsible, there was no recognition of existing Acts that might take effect in the event of the speed limit being abolished, and there was not sufficient safeguard against these under the Bill. This had, however, been provided for in the resolution passed at the last Committee meeting dealing with the subject, by which the principle of identification of motor cars was accepted, coupled with the abolition of the speed limit, subject to some assurance being obtained that such regulations be made as would as far as possible minimise the risks of automobilists which might arise from abuses of identification. A further resolution was that in construing the enactment as to furious driving, speed of a motor car should not in itself be evidence of furious driving. It was only fair to say that Mr. Scott Montagu had done nothing on his own initiative in regard to the clauses of the Bill, but had kindly taken it up in the House of Commons at the request of the special Legislative Committee.

The Secretary having read several letters which had been received expressing opinions upon the vexed question,

The Chairman first called upon Earl Russell, who said that he thought the natural course would have been for the proposals put forward by the Club to have been accompanied by some explanation and some justification.

The Chairman pointed out that they were only put forward as recommendations.

Earl Russell, continuing, took exception to the suggested appeal to the King's Bench Division of the High Court of Justice as being a condition which he thought under no circumstances could be put forward successfully in an Act of Parliament.

The Chairman stated that Mr. Montagu was against it, but Sir Francis Jeune thought that it might be successfully put forward.

Referring to the question of identification by numbers or names, Earl Russell thought that the Club should not encourage it, or propose that such a burden should be laid on the shoulders of automobilists. He thought the Government was too much occupied with other matters to introduce a special Bill to deal with this question. The County Councils' Association did not carry sufficient weight with the Government to be able to induce Mr. Long, or anybody else, to introduce a special Bill providing for this numbering, and, altogether, there was very little chance of any Bill of the sort being put forward, at any rate within the next five years. Year by year and month by month prejudice was decreasing. Horses and farmers were getting accustomed to cars, and all round the prejudice was continually decreasing. If numbers were put on, it would be impossible to take them off again. It would be twenty years before they could be removed. Viewing it from a practical point of view, could any number, whether 3 inches or 3 feet in height, be identified on the back of a motor car travelling at 40 miles an hour? The car would only be seen passing in a cloud of dust. He should like to see identification in the form of a small plate, by the side of the car, containing the number or name and address, which, when the car was stopped, could be examined and noted. To this there was no objection. A great grievance from which automobilists suffered was by persons who gave false names and addresses. No penalty could be too severe for that offence. It brought the whole sport into disrepute and urged the police to clamour for means of identification. The numbering proposal was not a practical proposal, as the dust would preclude the number of the car being indentified. It was a proposal he should have expected from a County Council or an Inspector of Police for a County. Wrong numbers would be taken and alibis would have to be continually proved, until it would become a byword that a certain set of witnesses were always brought down from the Automobile Club to prove these alibis He would rather wait another two or three years to have the speed limit taken off, as day by day the persecutions for excess of speed were becoming fewer and fewer in London, where they had an intelligent police force and intelligent magistrates, and there would be little difficulty in a few years in finally removing the limit of speed. Before the measure was put forward in the name of the Club a census of the Club should be taken.

Mr. Midgley supported Earl Russell's views, and mentioned that through carrying a number during the 4,000 Miles Tyre Trial he had been summoned for causing injury to a pony, and although he had won the case through the evidence of the Club Observer, it was still going on as there was an appeal now pending.

Mr. David proposed that the meeting be adjourned in order that a ballot from the whole of the members should be taken on the question. He protested that members who had objected to the numbering proposals should have been slanged repeatedly in the Club Journal. He did not like being called bad names because he objected to having a number on the back of his car. He suggested waiting before the question was brought forward. If numbering was to come, then let dog-carts and all other vehicles be numbered also.

Mr. Todd also agreed with Earl Russell, and pointed out that even if the speed limit were abolished, members would be persecuted under the law under which cyclists were persecuted for years for driving furiously or to the common danger. He thought it was absolutely absurd to expect anything in the shape of an assurance from Government that the regulations in regard to furious driving would be so interpreted as to minimise the risks to automobilists which might arise from abuses of identification.

Mr. T. Horsey asked whether, in the opinion of the Club Committee, if the Club did not run a Bill the Government would.

The Chairman left the question to Mr. Montagu, but pointed out that every member of the Committee had been against identification to start with, and had only put the numbering forward solely as a question of expediency. They had been informed quite recently that a Bill was going to be brought forward by the Government itself if the Club did not bring in a Bill. On the other hand, on the highest authority they had recently been told that the Government did not intend to press the matter further. The Government might not have the same view to-morrow.

Mr. Charles Jarrott thought it was best to leave matters alone, and in the event of the Government bringing in a Bill to enforce numbering and at the same time to keep the speed limit, the whole energies of the Club could then be concentrated in the direction of removing the objectionable clause in the Bill.

The Chairman pointed out that in spite of any Act of abolition of the speed limit, the Local Government Board had authority without any Act of Parliament to put in their articles at any moment that numbers should be put on the cars.

Mr. John Scott Montagu regretted that the latest recommendations of the Legislative Committee, the draft of which was in Mr. Firth's hands at the present moment, had not been placed before the meeting as it might possibly have altered a good many of the criticisms which had been passed. He had only been the representative of the Committee in introducing the Bill, to whose decisions he was then loyal, and was still so. He placed himself unreservedly in the hands of the Club as a whole to carry out their wishes. What the Committee really had in view in their proposals was to provide some means of catching the man who was a disgrace to the sport, and not to put themselves forward as championing an unfettered speed limit. The decision of the High Court that a motor car, even if there was no public on the road, could be held to be driving furiously to the danger of the lives and limbs of the public, stood as law to-day. It was thought at one time that the Legislature should be asked for motor cars to come under the common law and have no speed limit at all, but rely on that solely, without any question of numbering at all, but the more this was considered by the Committee the less it was liked, and they were then driven back to drafting a Bill in which advantages for automobilists could be obtained. Mr. Walter Long told him only the other day that so far as his department was concerned they would not consider any alteration of the speed limit unless some sort of identification were imposed. The Prime Minister only that day had told him that much as he thought it desirable to bring in a Bill upon the subject, that the Government could not themselves take it up this session. The chances therefore of a private member getting a Bill through were very small indeed. As far as his Parliamentary opinion was worth, he was certain that unless they were prepared to stay where they were to-day and go on suffering what they were suffering to-day, they would never get any extra speed limit from the House of Commons without extra identification. Personally, he should like to go as fast as he could and never be identified, but that he knew to be impossible, like many other things. If a vote were taken on the income tax there would not, he thought, be much income tax. They had to make a reasonable compromise with reasonable opponents, taking in consideration the interests of the public and their own interests. He thought some means of identification would have to come before any release could be obtained from the present obstructive legislation.

Mr. T. W Staplee Firth, in a well-balanced speech, opened by reciting the present powers of the Local Government Board, endorsing the Chairman's views as to these. No doubt the Government were prepared to abolish the speed limit, but they insisted on identification in return to enable the man to be checked who knew no better than to tear through villages and through dangerous parts of the country. The Government were pressing forward and asking Mr. Montagu to bring in his Bill. If the speed limit was abolished identification must be given, and as a safeguard if identification were introduced, the whole of the old Highway Acts and the recent Acts which govern the traffic on the highways, such as furious driving, should be abolished in regard to automobiles. That was why they put forward that, in constructing the enactments as to furious driving, the speed of a motor car should not necessarily be taken to be furious driving. It was hoped by these enactments, and by the measure which was proposed to be brought into this Bill, that the decision upon this point would be got round, and that no such decision shall ever be given against automobilism. Further, the number itself should not in the first instance be taken in giving evidence in any offence, but that the person complaining should show and prove to the Court that he had desired him to stop. Personally he suggested, instead of numbers on cars, the person driving the car should have a certificate which he must produce when called upon, but friends of Mr. Montagu in the Cabinet did not seem to like it. There was still an enormous majority in the country against automobilists, and a majority in the House of Commons against them, and if fight was shown now they would probably come off worst. For that reason the Legislative Committee proposed that they should try and meet the enemy by cutting the ground from under him in such a manner that he would give them all they wanted, or rather all they could reasonably expect. If the Bill was to drop they must remember that the summer was coming on, and that they would have to suffer among the rest from persecution. He was himself a victim, having been summoned twice, and his friend Mr. Montagu was an ex-convict. He congratulated Mr. Montagu upon the fact, a sentiment which was cheered to the echo.

Earl Russell, in reply to several of the speakers, said he did not place much reliance upon the proposed safeguards mentioned by Mr. Firth, that certain interpretations should be placed on statutes, such as the Highways Act, as when the Bill came into the House these clauses would be knocked out by the first person who objected to them, and the Bill would go on without them. They did not want large numbers on the back of their cars. He did not object to identification, but it should not be in such a conspicuous form. He supported a form of identification mark, whether in the driver's pocket or on the side of the car, which would enable the name and address of the person responsible for the car to be taken when stopped, and it seemed to him that that was the remedy, and he hoped that the members of the Club would be unanimous in saying that they did not want large numbers.

The Chairman in summarising the views of the speakers said there appeared to be several views that should come before the members of the Club. There were those who did not wish means of identification at all, but wished for an increase in the speed limit, others who wished for identification to be given as a consideration for the abolition of the speed limit, and a third view of those who knew that legislation must come afterwards but thought it better not to do anything at all for the present but to let public opinion grow more favourable, and bring in legislation afterwards. Nobody wanted to disfigure his car if he could help it, but the difficulty was, as Mr. Long had put it very strongly in a speech delivered at the Club, to suggest a means out of that difficulty. They were now getting a Bill ready in case it might be necessary for them to have a Bill. Of course this draft embodied a great deal that had been said that night, but he did not wish that it should be put forward as a view of the Committee until they had the expression of opinion of that meeting, and further, of the whole of the members of the Club by means of the suggested ballot.

It was finally resolved that the meeting declared itself to be opposed to any proposal for identification of cars when in motion by means of conspicuous numbering or naming, and requested that the vote of the whole of the members of the Club be taken by post.

Amongst other speakers during the evening were Mr. Tinney, Captain Deasy, Mr. Basil Joy, Mr. De Winton, and Mr. Cohen.

* * *

"CIRCULAR NO. 1" for February, 1903, of the Society of Motor Manufacturers and Traders has just been issued. It deals with the most recent developments in connection with the Society, and from it we learn that the amount of the share of the net profits accruing to the funds of the Association from the Exhibition recently held at the Crystal Palace will be announced at the first annual banquet of the members, taking place on April 3rd. The Society have become affiliated to the London Chamber of Commerce. The membership now comprises 65 firms.

COMPETITION OF SILENCERS.

THE competition for exhaust silencers organised by the A.C. de France started last Monday. About three days were required to test the 16 sets of apparatus entered, as a very important regulation was that all the silencers should be tested on the same motor, two by two alternately, and to arrive at anything like fair results not more than five or six could be dealt with each day. The points which will be considered by the judges, in addition to the actual absence of noise, will be the back pressure produced, the compactness of the apparatus, the weight, the absence of odour and smoke, and the simplicity and cost of construction.

We append below a table of results showing the relative noiselessness (A) and back-pressure (B) obtained on the first day with the different silencers. C gives the percentage of loss of power due to the silencers. Twenty marks was the maximum allotted for silence. None of the competing silencers absolutely eliminated noise, so none obtained full marks, but their relative excellence is indicated by the marks allotted in column A. The appliances were tried consecutively on the same motor as already stated, and in order to ascertain to what extent they reduced its power by producing back-pressure, the motor was coupled to a dynamo and its output measured. The output of the motor with respective silencers attached in watts (energy) is given in column B, the output without any silencer whatever being 5,676 watts.

	Weight-kilos.	A.	B.	C.
Chapuis and Co. ...	—	13	4,140	—
Ossant Frères	10·0	12	5,040	11·1
De Retz	19·05	12	4,950	12·2
Moto car	7·35	12	4,500	20·6
Ossant Frères	10·7	11	5,040	11·1
Rousseau	—	11	5,220	—
Megevet	—	10	5,220	—
Saint-Denis	—	10	5,310	—
Linzeler and Co. ...	—	10	4,680	—
Arnaud	—	8	5,175	—

* * *

SOME time back we published the particulars of the Glasgow to London Non-stop Trial, the date of which we announced last week as May 13th and 14th. In the main the rules as now published are identical with those which we gave. The chief object of the trial will be to demonstrate that Glasgow is within two days' run of London. The usual restrictions as to speed limit will be observed, the trial being one of reliability. Entries of cars of any particular type and horse-power are limited to two. The entrance fee is 7 guineas, the lists closing on April 13th. An official observer will accompany each vehicle, and one mark for every minute for which the car is at rest will be deducted, except for compulsory stop at Leeds, traffic, accidental detours, and tyre troubles. For the latter, one mark will be deducted for each five minutes occupied with tyre adjustments. The official maximum time allowed will be upon the basis of the legal speed throughout, after allowing for lower speeds through towns and villages. Time occupied on the journey in excess of this maximum time will be penalised to the extent of one mark for every minute in excess. Arrival at the end of a stage in advance of the minimum time permitted will involve immediate disqualification. The number of passengers carried will be stated on the certificates to be issued, but such number is optional. Vehicles will start from Glasgow on May 13th, between 3 and 7 a.m., and Leeds on May 14th, between 5 and

9 a.m. At Leeds the cars *must* be given into the charge of a representative of the Club at an official garage, but, curiously, the Club notify that they will not be responsible for the safety of the cars in the Leeds depôts. Cars not starting within the appointed hours, within one minute after the order to start the engine has been given, will lose one mark per minute until a start is made. All replacements must be notified to the Club Secretary, and observers are not allowed to assist in adjustments or repairs.

THE New York to Philadelphia run on Washington's birthday had to be finally abandoned owing to the fearful snowstorm which prevailed.

OWING to a dense fog the Consumption Trials of the winners in the recent *L'Auto* Competition, which was announced for last Monday, had to be postponed until next Monday, the 16th inst.

THE season's programme issued by the A.C. of Milan embraces several Tourist Runs, a Consumption Trial, a Road Race for the Confaloneri Challenge Cup, and an active participation in the 300 kilometre race announced in connection with the Udine Exhibition.

CONSENT has been accorded for the Paris-Madrid Race by all the French local authorities between Paris, Bordeaux, and Behobie, the point on the French frontier where the cars will pass. The first stage will be from Versailles to Bordeaux, 552 kiloms.; the second stage to Vittoria, in Spain, Madrid being reached on the third stage.

BAD weather necessitated the postponement of the Fournier-Barden Motor Cycle Match for £1,000, at Canning Town Track, last Saturday. The event was held over until Thursday, this week. On Saturday both riders were present and about 2,000 spectators passed the turnstiles, but the downfall of rain soon after precluded all chance of the match being run. For the credit of British sport we are glad to say there was no sign of the talked of demonstration against Fournier.

SEVERAL *final* programmes have have been issued by those responsible for the Nice Automobile Week. The latest differs somewhat from those previously announced, and includes the following fixtures:—March 28th, Brake Trial; 29th, *Corso fleuri*; 30th and 31st, Tourist Car Competition; April 1st, Turbie Hill Climb; 2nd, Monte Carlo Appearance Competition; 3rd, La Turbie Speed Kilometre (Coupe de Caters); 4th, Consumption Trial; 5th, Speed Mile and Kilometre (H. de Rothschild Cup); 6th, Exhibition.

MOTOR pacing will be introduced in the Southern Six Hours' Race at Herne Hill for the first occasion, the event being confined to singles, although tandems have played a very prominent part in previous contests. The regulations governing the race are that ordinary pacing rules for open amateur races shall apply as far as practicable; that the motor cycle must be privately owned, and the horse-power not exceed $3\frac{1}{4}$. They must also be of the same construction as those in general use for ordinary riding. No artificial construction for sheltering the rider from the wind will be permitted.

THE fine premises in Shaftesbury Avenue known as the Sinclair Gallery are to be occupied as a motor car depôt.

MR. ROWLAND WINN read a paper, entitled "Various Types of Transmission used on Motor Cars," on Thursday, before the Yorkshire Automobile Club at Leeds.

THE Leicester Corporation have placed an order with Mr. C. T. Crowden, of Leamington, for a combined motor fire tender and chemical fire engine similar to the one just completed for the Leamington Corporation.

AN auction of motor cars is being held to-day (Saturday) by Messrs. Shaw and Lee at the garage of the Firefly Motor Company, 72, High Street, Croydon. Thirty-three lots are enumerated in the catalogue, and include Daimlers, Gobron-Brilliés, Stars, Rochets, Renaults, Vivinus, M.M.C.'s, De Dions, and three Excelsior and other motor bicycles.

THE Marquis of Anglesey has acquired Mr. Edge's 1902 Gordon-Bennett Napier car from Mr. C. Jarrott, into whose hands it passed after the Crystal Palace Exhibition last month. It is not to be idle during the present season, but will probably take part in several of the "classic" events, and it will be held in readiness for Mr. Jarrott against "emergencies" in the Gordon-Bennett Race.

"GALOOTS in motor cars and go-boys on bicycles" were last July warned off the neighbourhood by a member of the rural council responsible for the upkeep of the Irish road between Kilcoole and Newcastle. The occasion of this gracious speech was an application for the repair of the road in question. By an extraordinary coincidence the death now is announced of this same councillor through the wheel of his cart being caught in one of the ruts it was sought to improve away.

THE Great Central Garage, Limited, have been appointed special agents by Messrs. Evart-Hall, Limited, for the sale of the Charron-Girardot and Voigt cars. The Company are in a position to deliver these cars from stock at their garage at 300-306, Marylebone Road, and Lord Effingham has booked the first of this celebrated make under these new arrangements. The "Earl" car, which we recently illustrated, will be also handled as heretofore by the Great Central Garage, Limited.

MANY of our readers will be interested to hear that the necessary plant is being laid down in this country for the manufacture of pressed steel frames for automotor chassis. Messrs. Fielding and Platt (Limited), who are one of the largest makers of hydraulic presses, inform us that they are now engaged in manufacturing a complete hydraulic press and plant for this purpose, and point out that such machinery enables a great saving of time and expense to be made, as such a press is capable of turning out frames at the rate of about 10 or 12 per hour.

CONDITIONS are being formulated by the Marine Motor Sub-Committee of the Automobile Club in connection with the Alfred Harmsworth International Cup for Motor Boats. The first race will take place in Queenstown Harbour, Cork, just after the Gordon-Bennett Cup Race, which will probably be run on July 7th. Competing launches must not exceed 40 feet over all measurement of hull, but there will be no restrictions as regards motive power. Each boat must carry two hands, of whom the helmsman must be an amateur.

Under the name of Sanders, Morgan & Co., Mr. A. G. Sanders, electrical engineer, and Mr. D. H. Morgan, motor car engineer, both of Cheltenham, have combined to carry on business at "The Garage," 22, Clarence Street, Cheltenham. The firm have a repair shop fully equipped with a good set of machine tools to enable them to carry out repairs of every description. Petrol, oils, and an extensive stock of accessories will be kept, so that all reasonable replacements can be quickly effected in connection with motor cars.

The King went to Sandown Park last week in the Prince of Wales's new 22-h.p. Daimler. The body of this vehicle, as our readers know, is of the wagonette type with canopy and glass front screen. A large number of sightseers lined the roads to watch the King go by, and his Majesty's reception all along the road and on the course was extremely cordial. That his Majesty is always ready to give public proof of his appreciation of the automobile is evidenced by his action in becoming Patron of the Automobile Club. Invading the sacred precincts of the horse in this way in a motor car may be almost looked upon as carrying the war into the enemy's country. When this line is adopted by the Monarch it cannot fail to produce a marked effect.

The quaint old town of Weatherby was on Saturday visited by a goodly gathering of members of the Yorkshire Automobile Club, who had run out from Leeds, taking *en route* the famous Harewood Avenue and Collingham Bridge. Those joining the run made their headquarters at the Angel Hotel and included Mr. Kirk (12-h.p. Gladiator), Mr. Atkinson and party (11-h.p. Clement), Mr. and Miss Armitage (11-h.p. Clement), Mr. Bayliss (Sunbeam car), Mr. A. W. Dougill, Hon. Sec. (8-h.p. Loidis), Mr. and Mrs. Winn (Renault), Mr. Wharam and Mr. Borland (4-h.p. Renault), Mr. Roslington and party (9-h.p. De Dion), Mr. Milner (Argyle), Mr. Pepper and party (12-h.p. Belsize), Mr. Barton (Darracq), Mr. Bottomley (Boyer), and Mr. Smith (Gladiator).

No small part will be played by the Irish Automobile Club in the organising and carrying out of the arrangements connected with the Gordon-Bennett Race. Under the leadership of Mr. G. W. D. Goff and Mr. R. J. Mecredy, every attempt has been made to support the energetic and judicious efforts of Mr. Claude Johnson, the Secretary of the Parent Club. At the Annual General Meeting of the Irish Club held last week in Dublin, the President, the Rt. Hon. Horace Plunkett, announced that the Club had secured the Earlsfort Terrace Rink for a period of three months from June 1st next as a garage and Club rooms. The object in renting these commodious premises was to afford facilities for meeting and accommodation to Club members and the visitors who will be swarming into Dublin in connection with the great International race. The premises, which are very centrally situated, should prove of enormous convenience to those assisting in the event. At the same meeting, the officers for the ensuing year were appointed as follows:—President, Right Hon. Horace Plunkett; Chairman, Mr. W. G. D. Goff, J.P.; Hon. Secretary and Treasurer, Mr. R. J. Mecredy, 2, Dame Court. Committee:—The Marquis of Waterford, Lord Louth, Lord Plunkett, Mr. T. Talbot-Power, Sir H. Robinson, K.C.B., Mr. L. Murdock, Mr. W. Sexton, Colonel Challoner Knox, Mr. E. F. James, Mr. R. H. Wandsford, Mr. C. G. Townsend, Mr. C. J. Engledow, Mr. B. Barrett, Mr. C. W. Hely, Mr. F. Hall, Mr. Guillimore O'Grady, Mr. C. C. Yeldon, D.I., Captain H. R. Langrishe, Mr. H. Goff, and Mr. E. C. Herdman.

It was decided last Saturday to form "The South Wales and Monmouthshire Automobile Club." Lord Windsor was elected President, and amongst those who personally supported the scheme were Messrs. Godfrey Clark, Llantrisant (chairman); J. L. Proger, Penarth; P. O. Davidson, Penarth; L. Gottwaltz, Penarth; Dr. Prichard, Cardiff; Dr. J. G. Thomas, Hirwain; M. de Soldenhoff, Cardiff; A. L. Davies, Cardiff; G. B. T. Nicholl, Newport; W. Parker Thomas, Cardiff; Victor E. Brukewich, Cardiff; G. L. Watson, Newport; Charles F. Peaty, Cardiff; A. J. Duchesne, Barry; Rees Jones, Barry; Harry Cousins, Penarth; J. J. Neale, Penarth; R. Clay, Cardiff; H. West, Cardiff, and T. B. Appleby, Penarth. A membership of 56 has already been enrolled, and Mr. Appleby, who has been mainly responsible for this new Club, has consented to act as honorary treasurer.

All members of the New York Motor Cycle Club who score at least 3,000 miles between March 1st and December 1st of the current year will be awarded gold medals by the Club.

Carl Benz, the founder of the famous Mannheim firm of motor manufacturers, has retired from active control of Benz and Company, his son, Herr Eugen Benz, now taking supreme control.

The cold wave and fearful snowstorm experienced in America at the commencement of the Chicago Automobile Show greatly interfered with the attendance at this fixture. Towards the end of the week matters mended somewhat, but taken all through, the show was not a stupendous success. No practical machines embodying new principles were staged, although several "freaks" were exhibited. The general opinion of the traders appears to incline to one national show only for the future, and that to be at New York. With few exceptions big business is not reported. Amongst those who did the largest amount of trade were the Olds Motor Works and the E. R. Thomas Motor Company.

At the fifth general meeting of the Aero Club of France, held last week, some interesting statistics were published in respect to the combined performances of the members of the Aero Club. By these it appears there have been for the past year 152 ascents, with a consumption of 170,480 cubic metres of gas, 444 passengers carried, and a distance of 15,746 kiloms. covered. The balloons remained in the air 751 hours. The total figures for previous years' performances of members of the Aero Club were 524 ascents, 1,519 passengers carried, 646,700 cubic metres of gas consumed, a distance of 75,456 kiloms. traversed (equal to nearly twice round the earth), and 3,214 hours in the air (equal to 134 days). These figures give an average for each ascent of gas employed, 1,234 cubic metres; passengers carried, 2·9; duration of journey, 6 hours 8 minutes; distance, 144 kiloms.; average speed per hour, 23·477 kiloms. Amongst the Committee for the current year, Sir David Salomons, Bart., was again elected.

Mr. Norbert Chereau has been appointed manager for the sale of the Bleriot Lamps in Great Britain, the depôt for the United Kingdom being at 54, Long Acre.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Clarkson (Limited), Moulsham Works, Chelmsford, Essex.—Capital, £1,000 in £1 shares. Principal object, to acquire the business of the Clarkson and Capel Steam-Car Syndicate (Limited). The first directors are F. Fremlin (chairman), A. Jones, and T. Clarkson.

Dechamps Motor Company (Limited).—Capital, £1,500 in £1 shares. Object to acquire from the Graphic Motor and Engineering Company (Limited), the business, goodwill, and the right to use the name Déchamps in connection with motors, motor cars, &c.

Ljungstrom Engine, Boiler, and Condenser Company (Limited).—Capital, £36,500 in £1 shares (15,000 preference). Chief objects, to acquire (a) the benefit of certain existing inventions and patents in relation to balanced rotary steam engines and steam generators and evaporators (known as the Ljungstrom Patents); (b) the undertaking of the Ljungstrom Engine Syndicate (Limited), incorporated 1901, and now in liquidation.

Standard Motor Company (Limited), 37, Earl Street, Coventry.—Capital, £5,000 in £1 shares. The first directors are R. W. Maudslay (chairman) and G. A. Maudslay.

LAW REPORTS.

Gardner-Serpollet Cars.—Mr. Justice Farwell, in the Chancery Division on Friday, had before him an interlocutory application in the action of Albert Edward Hodgson v. the Speedwell Motor and Engineering Company (Limited), George Hopkins, Frank Gardner, and Leon Serpollet, by which the plaintiff claims a declaration that under an agreement of the 18th of October, 1901, he is entitled to the full and exclusive rights to manufacture and sell, or arrange with other firms to manufacture and sell, and to grant licences for cars under the Gardner-Serpollet patent. Plaintiff also asks for an injunction to restrain Hopkins, Gardner, and Serpollet from supplying the Speedwell Company with, and permitting them to manufacture and sell, any cars described as "Gardner-Serpollet," and to restrain the Company from holding themselves out to be manufacturers of or dealers in such cars. The Company applied that the statement of claim might be struck out on the ground that it disclosed no cause of action.

The claim set out the agreement of 18th October, 1901, under which the plaintiff was to have the full and exclusive rights to manufacture and sell, and to arrange with other firms to do so, with the consent of Hopkins and Gardner, to grant licences to others to manufacture and sell in Great Britain and the colonies, steam motors and motor cars suitable to carry passengers or goods up to 30 cwt. under the Gardner-Serpollet patents for three years from January, 1902, or until a new Company was formed. The royalties were to be £25 per 6-h.p car sold and delivered, £37 10s. per 9-h.p., and £50 per 12-h.p. car, and they were to amount to not less than £5,000 for the first year, £6,000 for 1903, and £7,000 for 1904. Plaintiff undertook to obtain for a new Company the option to buy up at any time before the end of 1904 the British Power, Traction, and Lighting Company (Limited), including its motor business, machinery, plant, &c., and all rights which might be granted to that Company in connection with the Gardner-Serpollet patents. The total amount of the purchase money was not to exceed £100,000. In consideration of the plaintiff devoting his time and best energies to working up and developing the Gardner-Serpollet business and doing his utmost to make it a success, and of his guaranteeing and paying the royalties in the event of its being decided to sell the Gardner-Serpollet patents and trade marks for Great Britain and the Colonies for the purpose of forming a new Company, the plaintiff should receive one-fourth of all benefits or profits which might arise from such sale, so far as the interests of Hopkins, Gardner, and Serpollet were concerned. In February, 1902, defendant Company inquired on what terms plaintiff would grant permission to them to import Gardner-Serpollet cars into England, and on the 6th March plaintiff stated the terms, but the Company did not assent to them. They then advertised "genuine French Gardner-Serpollet cars," and in letters they described themselves as manufacturers of and dealers in Gardner-Serpollet cars. Plaintiff issued a writ and served notice of motion for the 8th April, 1902, but Hopkins, Gardner, and Serpollet pressed him not to take further steps, with a view to a settlement. The negotiations were not successful, and Hopkins, Gardner, and Serpollet were added as defendants. Plaintiff alleged that he had suffered great pecuniary loss through the Company advertising themselves as "sole agents and representatives" for the Gardner-Serpollet cars, and claimed damages.

Mr. T. Terrell, K.C. (Mr. A. J. Walter with him), for the Company, argued that if the patents were bad the plaintiff was not entitled to claim any rights under it. The Company were not parties to the agreement, and they had a right to manufacture anything they pleased if there was no patent. They, therefore, ought not to be put to the expense of defending the action.

Without calling on Mr. Upjohn, K.C., who represented Mr. Hodgson, Mr. Justice Farwell refused to say that there was not a case for argument, and dismissed the application with costs.

COURT OF BANKRUPTCY.

British Power Traction and Lighting Company (Limited).—Meetings of creditors and contributories were held last week under the winding-up order made against this company.

The chairman reported that the company was formed in September, 1900, with a nominal capital of £52,000, to acquire the businesses of the Engineer Cycle Works (Limited), of York; the Eclipse Brass and Copper Company; the Anglo-American Motor Car Manufacturing Company, of Halifax; the Power Transmission and Traction Company, of Bradford; and the assets of the Disc Hub and Components Company. The purchase price of the five businesses was eventually fixed at £57,282. Of the capital £8,007 preference shares were issued for cash, and £9,480 first mortgage debentures were issued for cash to Mr. Hodgson, the chairman. In September, 1901, further working capital being required, a further £20,000 debentures were issued, making the total issue £40,000. The company also borrowed £20,000 from their bankers on the personal guarantee of the directors, who had since paid off the loan and were now unsecured creditors for the amount. There were further unsecured debts, £28,906, and the assets on the appointment of the Receiver were valued at £37,548. The account with the contributories showed a deficiency of £77,955. The directors, however, claimed the exclusive right to manufacture motor cars under the Gardner-Serpollet patent, while Mr. Hodgson, who obtained the license, claimed it as his personal property. If the Court decided that this asset belonged to the company the prospects of the unsecured creditors would not be so black as they appeared from the statement of affairs. The company had traded at a total loss of £22,903, and in August last a receiver for debenture-holders was appointed. The failure was attributed to lack of capital, to the fact that the early part of the company's work was experimental, and to its inability to deliver its motor cars as required. The liquidation was left in the hands of the Official Receiver.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published March 12th, 1903.

3,919. M. A. Tighe. Free wheel clutches.
3,936. P. Philippon and M. Chevalier. Rotary motors.
4,040. H. Binns and S. Parr. Mechanically-propelled vehicles.
6,005. A. Angst. Speed-changing devices.
6,977. Humber (Limited) and J. Budge. Motor vehicles.
7,378. F. Strickland. Internal combustion engines.
23,658. F. F. Haustgen. Clutch mechanism for motor cycles.

Published March 19th, 1903.

4,482. S. J. Rose. Spring, chain, or gear wheel.
5,517 J. S. V. Bickford. Automatic feed regulator for steam boilers.
6,689. S. T. Richardson and R. Price. Road travelling wheels.
6,976. W. Maybach. Motor vehicles.
7,330. R. W. Smith and J. L. J. Gobiet. Motor bicycles.
8,704. W. J. Crossley and W. L. J. Webb. Internal combustion engines.
9,144. Albany Manufacturing Company, Limited. Exhaust switch and blower for light steam cars.
9,425. H. Salsbury. Lamps.
9,434. A. Clement. Carburettors for motor bicycles.
9,466. G. L. Scott. Friction clutch.
13 930. F. G. Seeley. Reversing and variable speed gear.
26,755. L. Stilmant. Variable speed gear.
28,412. Marble-Shaft Automobile Company. Friction gearing.

Applied for in 1903.

Published March 12th, 1903.

60. H. Fischer. Silencers.

Published March 10th, 1903.

1,275. E. P. Dawson. Variable speed friction gearing.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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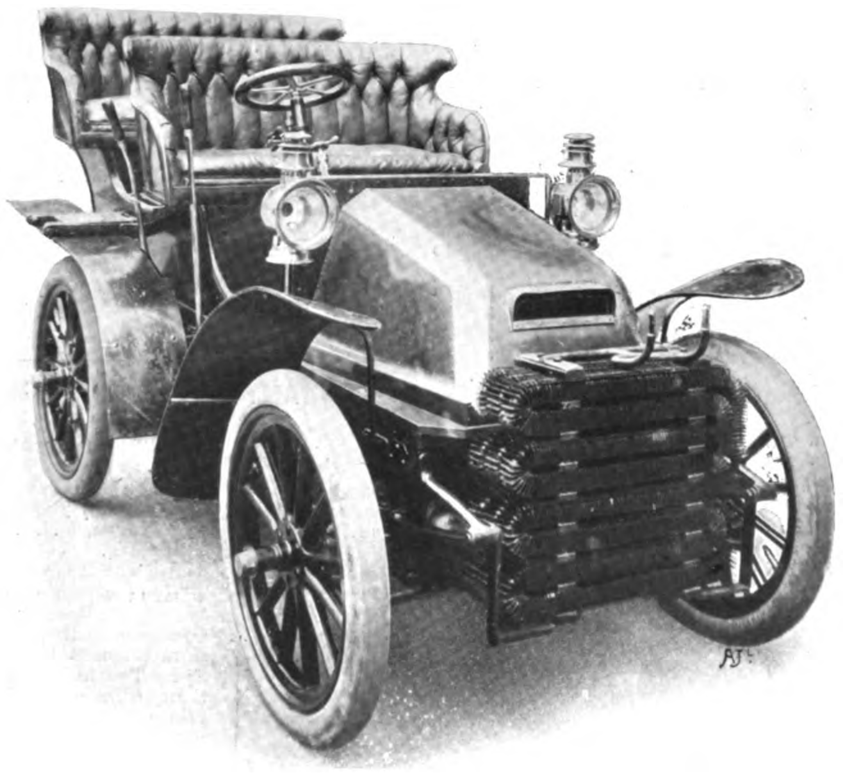

A 6-H.P. MIESSE STEAM CAR. (*See page* 292.)

CARS AND SYSTEMS.

FULL illustrated descriptions of the majority of the leading motor vehicles and systems have appeared in THE AUTOMOTOR JOURNAL during the past year. These enable the mechanism and functions of the various parts pertaining to each separate system to be clearly understood. The cars and systems described include the following :—

	No.		
Brooke	67	April	19
Brush	68	,,	26
	82	Aug.	2
Simms Motor War Car	67	April	19
Benz-Parsifal	68	,,	26
	106	Jan.	17
Bardon	69	May	3
Deschamp	70	,,	10
Gillet-Forest	70	,,	10
Roots and Venables	70	,,	10
Wolseley	71	,,	17
	73	,,	31
	74	June	7
Napier	71	May	17
	101	Dec.	13
	107	Jan.	24
Blake	72	May	24
Humber	75	June	14
	76	,,	21
	82	Aug.	2
	108	Jan.	31
Fischer	75	June	14
	87	Sept.	6
Meredith	75	June	14
Rex	77	,,	28
Gardner-Serpollet	77	,,	28
	78	July	5
	79	,,	12
	80	,,	19
Oldsmobile	80	,,	19
	86	Aug.	30
Daimler	81	July	26
	82	Aug.	2
Ivel	81	July	26
Renault	81	,,	26
Gladiator	82	Aug.	2
	104	Jan.	3
Protos	83	Aug.	9
Weston	83	,,	9
Chatel-Jeannin	84	,,	16
Brightmore	85	,,	23
Lister	85	,,	23
Prescott	85	,,	23
Pioneer	86	,,	30
Ariel	89	Sept.	20
	90	,,	27
	91	Oct.	4
Wilson and Pilcher	90	Sept.	27
	108	Jan.	31
Motor Mfg. Co.	92	Oct.	11
Princess	92	,,	11

	No.		
Swift	93	Oct.	18
Milnes-Daimler	94	,,	25
	95	Nov.	1
	113	Mar.	7
White Steamer	95	,,	1
	96	,,	8
	106	Jan.	17
Clarkson and Capel's "Chelmsford"	96	Nov.	8
	97	,,	15
	98	,,	22
Alsop	97	,,	15
Alldays and Onions' "Traveller"	98	,,	22
	99	,,	29
Toledo (Petrol)	98	,,	22
,, (Steam)	107	Jan.	24
Peerless	98	Nov.	22
Pedrail	98	,,	22
Watsonia-Durkopp	99	,,	29
	100	Dec.	6
	101	,,	13
Pipe	102	,,	20
Wartburg	104	Jan.	3
Darracq	104	,,	3
De Dietrich	104	,,	3
Charron, G. V.	104	,,	3
Ader	104	,,	3
Huber	105	,,	10
Delahaye	105	,,	10
Krebs Carburettor	105	..	10
Velox	105	,,	10
	106	,,	17
De Dion	106	,,	17
Mercedes	107	,,	24
	114	Mar.	14
Becket	108	Jan.	31
Waddington	108	,,	31
Chenard and Walcker	108	,,	31
	109	Feb.	7
City & Suburban Petrol-Electric Car	109	,,	7
Thornycroft Petrol Car	110	,,	14
Earl	111	,,	21
Germain (Electric change-speed).	111	,,	21
Locomobile (1903)	112	,,	28
Cottereau	113	Mar.	7
Simplex Speed Gear	113	,,	7
Maudslay (1903)	114	,,	14

Any of the above copies can be obtained, price *4d.* each, post free, upon application to the Publishers, F. King and Co. (Limited), 44, St. Martin's Lane, London, W.C.

N.B.—For descriptions of other cars and systems, *see* General Index to Vol. VII.

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CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.	
March 21–28	Cordingley and Co.'s Exhibition, Agricultural Hall.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14	Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
*June	Eliminating Race for Gordon-Bennett Race.
*June 13	Gymkhana at Ranelagh.
*July 1st to 15th	Gordon-Bennett Cup Race. Speed Trial at Dublin. Start for International Tour through Ireland. Motor Boats Race, Queenstown Harbour (Alfred Harmsworth Challenge Cup). International Hill Climbing Trial at Belfast (Henry Edmunds Trophy).
*August	Tourist Motor Bicycle Reliability Trial.
*September	The 1,000 Miles Trial.
1904.	
	*Light Van Trials.
*Feb. 12–24	Crystal Palace Exhibition.

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
March ...	... "Criterium du Quart de Litre" (*L'Auto.*)
March 16–30	... Vienna Automobile Exhibition.
March 17–28	... "Criterium des Transports Automobiles." 1,072 kiloms. (*La France Automobile*). Classes A, B, E.
March 22–28	.. Ditto. Classes C, D, F, G, 1,014 kiloms.
March 28-April 5	Nice Automobile Week.
April 16–20	... A. C. de Touraine Tourist and other Trials.
May ...	... Speed kilom.—Geneva (Swiss A. C.).
May 14 ...	... Paris-Madrid. Start of Tourist Section.
May 16–24	Stockholm Exhibition.
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June	... Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18–23	... Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 25-July 1 ...	Aix-les-Bains Auto Week (Auto Club du Rhone).
July ...	... Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
July 5 ...	... Laffrey Hill Climb.
July 5 ...	... Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 19 ...	... Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August ...	... Circuit des Ardennes.
August 16	... Race Trelex-Saint-Cergves (Swiss A. C.).
September	... Udine Exhibition (Italy).
Oct. 15–21	... Leipzig Exhibition.
Nov. 15 ...	... German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

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PASSING EVENTS.

NOT A GOOD OMEN.

THE Royal Commission on London traffic, to the constitution of which we have referred critically on former occasions, has actually begun to sit. The first witness called before it was Sir Herbert Jekyll, of the Railway Department of the Board of Trade, and his evidence was not by any means of happy augury for the prospects of automobilism. He was evidently in favour of attempting to solve the problem by the introduction of yet more tramways; and to facilitate the adoption of more and more of these schemes of embellishing our street and still further congesting the already over-congested traffic, he proposes the formation of a tribunal on the lines of the Railway Commission, which is to make the path of the tramway promoters smooth before them. Most of the other witnesses favoured tramway schemes, and objected to the railway companies' opposition to them. Fortunately the Chairman appears to have heard of the automobile, and he asked the pertinent question of one of the witnesses, "Do you think the employment of motor vehicles would have a beneficial effect on the traffic?" and this elicited the following reply: "Undoubtedly, inasmuch as the motor vehicles would occupy less space, move more quickly, and I think, are easier to steer." This is unquestionably the truth, and may be regarded as a testimonial to the automobile on the part of a somewhat unwilling witness. It is remarkable, considering this admission, that no suggestion was put forward for organising automobile services instead of further jamming up the streets with trams. But we are thankful to find that the same witness who thus testified in favour of the automobile—Col. Yorke, Chief Inspector of the Railway Department of the Board of Trade—was positive about the absolute necessity of elaborate street widening, particularly from North to South.

NO MORE SECRET COMMISSIONS.

THOSE "dissolute mechanics" who have been denounced both in our editorial and correspondence columns for exacting donations from car builders when their employers purchase a car, have been taken in hand by the Lord Chancellor. He is bringing in a Bill which ought to make these gentry and their colleagues in other walks of life, who take secret commissions, feel very uncomfortable. The Bill appears to be expressly aimed at them, for, in his speech introducing the measure, the Lord Chancellor declared that the proceedings of these corrupt chauffeurs formed the latest development in the motor car industry. We think his Lordship is a little hard on the motor car industry, and we would have preferred the terms "excrescence" or "parasitical growth." That the evil is a real one, however, is plain enough, not only from what has appeared in this journal, but from the report of the Committee of the Chamber of Commerce, on which the Bill is founded, and on which the Lord Chancellor based his observations. The acceptance and even demand of secret commissions of this kind is not by any means confined to the black sheep of the automobile industry. It would seem from the report to be indulged in by almost every Englishman engaged in commerce, and a touch of comedy, at which it is impossible to repress a smile, is added to the situation by the circumstance that even doctors have been discovered taking commissions from the undertakers who have completed the work which their more scientific training commenced. Probably this sort of thing will never be completely stopped, but the Lord Chancellor's Bill will tend to considerably abate the evil, for he proposes to make it an indictable offence, punishable with imprisonment, with or without hard labour, for a year, or by fine up to £500. If the measure does nothing else it will provide everybody with a good excuse for refusing these exactions whenever a demand is made.

MR. CLAUDE JOHNSON AND HIS FUTURE SPHERE.

SEVERAL unauthorised statements have been circulated in regard to Mr. Claude Johnson's future connection with automobilism when he secedes from the Secretaryship of the Automobile Club in June next. Amongst other incorrect announcements is the statement last week in a contemporary to the effect that Mr. Johnson would be connected with a British company being formed to make Darracq cars. As a fact, Mr. Johnson will become a director, and possibly organising director, of the City and Suburban Electric Vehicle Company, Limited, where he will be intimately associated with Mr. Paris Singer and his very successful undertaking. The capital of this Company was recently increased from £100,000 to £152,000, the extra amount being subscribed for by Sir Ernest Cassel, Lord Revelstoke, and three of their friends. In an important undertaking of this description Mr. Johnson's extraordinary powers of organisation will be keenly appreciated, and without doubt we may expect to see the present scope of the Company very much extended.

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THE MOTOR PROBLEM, A ROAD PROBLEM.

MR. REES JEFFREYS's very able paper before the Automobile Club on the 12th inst., covered an enormous amount of ground, both literally and metaphorically, and touched on a number of questions of supreme interest to automobilists. The points were put with terseness and vigour. The very title chosen (which we give above) forms a condensed essay in itself. There is no doubt that Mr. Jeffreys's paper will have a valuable effect in enlisting the interest and sympathy of automobilists on behalf of the reforms to the advocacy of which so great a portion of his time and such an immense amount of energy is devoted. Many automobilists have been in sympathy with the general tendency of Mr. Rees Jeffreys's aims before the reading of his paper. Probably this attitude will be shared by all who either heard the paper read or who have perused the reports of it which have appeared. The question of adequate road accommodation is a burning one for the automobile movement to-day. It is a question which will burn much more fiercely in a few years' time, and Mr. Jeffreys is quite right in assuming that the future prospects of the movement depend upon the solution of the road problem. We doubt, however, that it will be wise, or even possible, for motor cars to go at an average speed of twenty-five miles an hour through towns, and we certainly do not agree that the motor car industry will be throttled if it is not rendered possible and general. Says Mr. Rees Jeffreys: "I am not exaggerating. If you say this speed—the given normal speed—is for ever impossible in the towns, then you have doomed the motor car." At any rate, if Mr. Rees Jeffreys is correct in this opinion, he does not put forward any suggestion for rendering its attainment likely. He proposes to build new roads between town and town, and in this way to tap country districts in which road communication is at present inadequate. He proposes to encircle towns and even villages with loop roads, and he puts forward admirable suggestions for remodelling the organisation by which roads are maintained. But he does not really tackle the question of the congestion of traffic in the existing streets of large towns. This is because he considers that the problem can be solved by means of his circular roads. "The ratepayers of London are spending huge sums of money for the purpose of widening some of the City streets. The money could be spent to better advantage in an encircling road, on which the through traffic could be diverted and the central streets relieved." An encircling road round most towns, particularly London, would be very useful. It is found so in Paris and other Continental towns where they exist, and we commented favourably on the proposal to build one when Mr. Rees Jeffreys first put it forward. But that it would relieve street traffic is to assume that the majority of the vehicles on, say, the London streets are not proceeding to a destination in the town itself, but are merely passing through to some point on the further side. Such traffic would naturally prefer to use the circular road. But candidly we do not believe that it amounts to 10 per cent. of the whole, or anything like it. Of course, this is not the case with small towns. Much of the traffic there encountered is through traffic merely. But then, the smaller the town the less the congestion, and the larger the town the smaller is the proportion of through traffic to total traffic. In the case of small towns and villages, these circular roads would naturally be of enormous convenience to automobilists. But that is because they could go round them at high speed, not because the congestion that would be thus avoided is serious.

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A DIFFICULTY that has confronted the reformers has been to formulate a scheme by which people might be induced to build roads. Of course, if any individual or association of individuals were to build a nice new road in a useful direction, everyone would be highly delighted, and would come and use it with the greatest pleasure. What is not apparent is how the builders of the road could recoup themselves for their outlay. For the use of railways, tramways, gas, electricity, and, above all, water, the public can be made to pay (often through the nose). You can only make them pay for a road by a system of tolls, and since the abolition of the turnpike system it is not likely that that would be permitted. Mr. Jeffreys proposes to empower the promoters of new roads to make compulsory purchase of the land needed for the road and a certain amount on either side of it. The value of this land, with an up-to-date motor road running through it, would soon become very great, and in this way the road company would get their money back. They would receive some of the enhanced value which their enterprise had conferred on the neighbourhood.

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As regards roads administration we quite agree that it will never be satisfactory until it is run on railway lines, that is, with one administration from one end of the road to the other. One railway management keeps the railway from Euston to Carlisle in order, and it is just as well kept in the most out-of-the-way districts as near the largest towns. The Great North Road from London to the same place is managed or mismanaged by no less than seventy-two separate, mutually independent, and sometimes mutually antagonistic, highway authorities. It is really a marvel that it is navigable. Another evil is the encroachment of buildings on the highway. Where it becomes imperatively necessary to widen the road the builders who have been thus allowed to encroach on the high road will get fancy prices by way of compensation. Mr. Jeffreys properly suggests that a measure should be brought in prohibiting the erection of buildings within sixty feet of the middle of the highway—an excellent proposal. But, "who will bell the cat?" Who will undertake to get such a measure through? Mr. Rees Jeffreys' paper, on the whole, is a most valuable contribution to the subject with which he deals, and though he does appear to us, as already pointed out, not to attach sufficient weight to widening the streets of towns, he does in general approve of the proposed Haussmannising of London, and gives full attention to the very serious aspect that the increasing blocking of the roads by tramways is assuming. At any rate his paper helps to bring out the enormous importance of the question, whether the automobile point of view or the general interests of the community are considered.

The most specifically practical proposal which he puts forward is the construction of a motor road from Shepherd's Bush to Windsor. This projected road has been before the public for some time, and we dealt with the suggestion, when first made, in the Journal for December, 1901. Since that date the proposal has been a good deal elaborated. The course remains the same and will run through the projected Garden City, but it is now intended to make the road at least 100 feet wide, to have two tramway tracks, leaving a wide space between them, and a space between each tramline and the footpaths. The fast traffic is to run between the tramways, and the slow traffic between them and the footpaths. This will provide a central track at least 30 feet wide for the motor cars, and this ought to be sufficient. We hope to live to see this carried out. It will be a good practical beginning, but we are not sanguine about its early completion. To Mr. Jeffreys' characterisation of English methods in such matters as being "to muddle along from hand to mouth," we would add that they muddle "exceeding slowly." But if any one man can wake up the lethargic national consciousness to a sense of the importance of the subject, that man would appear to be Mr. Rees Jeffreys.

THE GORDON-BENNETT RACE AND THE IRISH FORTNIGHT.

The arrangements connected with this important sporting fixture are gradually getting into shape. The enormous work entailed in organising the programme has hardly yet started, and to carry out the suggestions now put forward will tax to the utmost the voluntary workers who are invited to take part in this national event. The official programme will cover July 1st to the 15th. The official Irish headquarters of the Automobile Club will be at the Shelbourne Hotel, Dublin. The special committee appointed by the Club Races Committee, consisting of Mr. S. F. Edge, Mr. Claude Johnson, Mr. W. G. D. Goff, Chairman of the Irish Automobile Club, and Mr. R. J. Mecredy, its Honorary Secretary, started on Wednesday the labours which they have undertaken, these including the final settlement of the course, fixing controls, determining what road repairs are required, and banking up bridges where necessary. Amongst other things which will have to be dealt with in connection with the Race will be the arrangements for keeping the road by splitting up the whole course into ¼-mile sections, each section being in charge of two members of Automobile Clubs and two County Councillors. Amongst other suggestions are that the public are to be kept quite clear of all acute corners for obvious reasons. Buglers are to signal the approach of each car at various spots, and half an hour before the start of the race a high-speed car is to traverse the course as a pilot car, this to be driven by the competitor who is second to the successful candidate in the Eliminating Trial. To properly keep the road over the distance of 88 miles in the manner proposed, will require at least 704 club members and 704 representatives of councils, volunteers for these positions being asked for. Owners of motor cycles are also invited to act as motor bicycle stewards on the course. Illustrated notices are to be issued both in Irish and English, depicting for the benefit of the country folk the dangers of attempting to go on the course. These illustrations will be prepared by an Irish artist. Every precaution will be taken by the Races Committee to prevent the possibility of any dispute as to the times made by the cars, foreign representatives being invited to co-operate to this end. It is suggested to the French Club that competitors should not replenish their cars with fuel, water or oil, or effect any adjustment whatever in the controls under pain of disqualification. These should all be done in the running time of the cars. In like manner assistance in repairs, adjustments or replenishing should be confined to those actually on each car. Two minutes interval between each starter will be allowed, and the start will take place at seven o'clock in the morning. It is sought to postpone the Eliminating Trial for the British competitors until June 20th, subject to the approval of Messrs. S. F. Edge, Limited, and the Star Company, to enable other cars to take part in this trial. A reserve team will be constituted of the second, third, and fourth best cars and drivers in the Eliminating Trial. The proposed programme for the fortnight is as follows:—

July 1st.	Exhibition of the competing cars at Earlsfort Rink, Dublin.
July 2nd.	The Gordon-Bennett Race.
July 3rd.	Gymkhana at the Phœnix Park, Dublin, and torchlight procession to Dublin Castle at night.
July 4th.	Speed trials in the Phœnix Park, Dublin.
July 5th.	Rest (Sunday).
July 6th.	Tour to Newcastle and Belfast.
July 7th.	4-mile time test at Newcastle. Hill-climbing trial for the Henry Edmunds Trophy.
July 8th.	Return to Dublin.
July 9th.	Start for Cork (156 miles).
July 10th.	Eliminating race for motor boats at Queenstown, Cork, in the morning. Speed or hill-climbing trial in the afternoon.
July 11th.	Motor boat race for the Alfred Harmsworth Cup at Queenstown.
July 12th.	Rest (Sunday).
July 13th.	Start of tour through the south.
July 14th.	Arrival at Killarney.
July 15th.	Hill-climbing trial on the Killorglin-Tralee Road, for the County of Kerry Cup (for the fastest car irrespective of price) and termination of the official tour.

The speed trial in Phœnix Park will be divided into five classes for tourist cars and two for racing cars.

The tourist section will embrace (*a*), motor cycles; (*b*), 2-seated tourist cars, costing £300 or under; (*c*), 4-seated cars, £300 to £600; (*d*), 4-seated cars, £600 to £1,000; (*e*), 4-seated cars, over £1,000.

The racing classes will be (*a*), cars weighing under 650 kilogs. (12 cwt. 3 qrs. 5 lbs.); (*b*), cars weighing under 1,000 kilogs. (19 cwt. 2 qrs. 20 lbs.).

Probably on this occasion the *Daily Mail* 100 Guinea Cup will be run for over the kilometre (the fastest car, driven by any form of power, weighing under 1,000 kilogs.). Mons. L. Serpollet is the present holder of this Cup, which he won at Bexhill last year.

The holding of the suggested motor cycle race immediately following the Gordon-Bennett Race, it has been decided, is impracticable.

Several subsidiary excursions and events are put forward for organisation, which should help to make up a splendid holiday in our sister isle. It is a foregone conclusion that Ireland will receive an enormous influx of visitors, and the only difficulty no doubt will be to find sufficient accommodation for their wants.

It is gratifying to know that the Dunlop Company have, for the purpose of the Gordon-Bennett Race, withdrawn all patent restrictions in regard to pneumatic tyres for use on cars running in this event.

THE MIESSE STEAM CARS—PART I.

THE first Miesse car made its appearance in this country at the speed trials carried out by the Automobile Club on Lord Suffield's estate at Cromer last year, and excited no small interest at the time, owing to its speediness and silence of running. Since that time Thomas Turner and Co., the English manufacturers at Wolverhampton, who have been making these machines for the Miesse Syndicate, have obtained the necessary experience with them and have turned out a considerable number of vehicles. The Miesse system differs considerably from any other, although, broadly speaking, it may be ranked in the same category as the Serpollet, the White, and the Chaboche, the common characteristic of all these systems being the employment of a flash type of steam generator.

As is now pretty generally known, the adoption of a flash generator introduces entirely different conditions from those met with when using any of the more ordinary types of boiler, for not only does the high temperature of the steam necessitate special construction of the engine itself, but the relationship between its pressure and temperature ceases to follow the ordinary rules recognised in general steam practice. For these reasons, and also because the generation of steam is a much more hand-to-mouth process, necessitating special apparatus for feeding water to the boiler and fuel to the burner, a considerable amount of practical experience is essential before any makers can successfully build this type of car. It is hardly to be wondered at, therefore, that the English manufacturers of Miesse cars have hitherto been somewhat reticent with regard to giving any detailed description of them, and that several months were allowed to elapse before they were able to supply these vehicles to the public. It is unnecessary to enter very fully into the many difficulties which have had to be contended with in order to bring the mechanism up to its present state of development, for these have now been overcome. It is perhaps interesting, however, to indicate the kind of trouble which results when applying ordinary engineering practice in such cases. An instance of this is to be found in the looseness of fit which is required by many of the moving parts—the expansion due to the high working temperature being so great as to require such a looseness of fit as might appear to be bad workmanship in any other type of machinery.

In the present article we propose to give a general outline of the system and description of the cars. A subsequent article will deal with the system as a producer of energy, and describe the mechanism in detail.

In the Miesse system the boiler is built up of several layers of steel tubes, and is heated by a special form of burner which uses ordinary paraffin as a fuel. The water is forced into one end of the boiler either by a hand-pump, when starting, or by a mechanically-driven pump when the car is running; the quantity of water which is delivered by the latter pump depends upon the speed at which the car is running, but the actual amount which finds its way into the boiler is regulated by hand, any surplus being allowed to find its way back to the supply tank. The hand regulator consists of a by-pass, and it primarily enables the driver to regulate the steam pressure. The steam is taken direct from the other end of the boiler to the engine, and the engine is controlled by varying the cut-off and reversing gear; in some cases a throttle-valve is also fitted and it is so arranged as to be *closed* by depressing a foot pedal. A safety-valve and a hand-operated relief-valve are provided on branch pipes between the water-feed pump and the boiler, but the steam pipe from the boiler runs direct to the engine, and has no branch connections of any kind. The heat of the burner is entirely regulated by hand, and the fuel is fed from the supply tank to it under pressure. The pressure in the tank is automatically maintained, when running, by a pump driven off the crankshaft of the engine, the degree of pressure being kept constant by a relief-valve which opens when the desired pressure has been attained. The oil on its way to the burner passes through two vaporising coils which lie above the burner, and the gas generated in the vaporiser is led through the regulating valve to a single nozzle, which projects into a pipe forming part of the burner. The quantity of gas is controlled by the driver, but there is no regulator for the air. The air and gas pass along the pipe into a chamber from which a large number of parallel horizontal tubes project beneath the boiler. The tubes are perforated with rows of fine holes, drilled at an angle, which form the burner jets. The burnt gases are conducted from above the boiler by a flue passing across it, and down behind it; the flue is open to the air in front, and the necessary draught is created by the forward travel of the car. The engine is lubricated entirely on the splash system, oil being fed into the crank-chamber for this purpose. The engine itself consists of three parallel, horizontal, single-acting cylinders, fitted with mushroom valves which are operated by cams. The crankshaft has its three crank-pins arranged at angles of 120° from one another, and the power is transmitted through a pair of spur-wheels to a differential gear enclosed in the same casing with it. The differential gear is mounted upon a countershaft, lying across the frame of the car, from the ends of which side chains pass to the rear wheels. The exhaust steam from the engine is led to a radiator in front of the car, and any condensed water, as also any uncondensed steam passing through it, is led back by a pipe to the water tank.

The cars are being made in two sizes; but the general arrangement both of the 6-h.p. and of the 10-h.p. vehicles is identical, and is clearly shown in the accompanying illustrations. One of the 6-h.p. cars forms our frontispiece this week, and Fig. 1 represents a 10-h.p. vehicle. A chassis, which will be on view at the exhibition at the Agricultural Hall at the end of the week, at Stand 21 and 22 of the New Automobile Company, the London agents, is shown in Figs. 2, 3, 4, and 5, which are a view from above, from each side, and showing the regulating levers and pedals, respectively.

The main frame is rectangular, and is built up of wood, stiffened with steel flitch plates and corner plates. It is fitted with five cross-members of channel section, two of which carry the boiler beneath the bonnet in front, one is beneath the dash, and the other two support the fuel tank, H, and the water tank, N, at the rear. The engine is carried in the centre of the frame on two cross channels, which are rigid with brackets bolted to the frame. The cylinders, A, are cast in one piece, and are bolted to the crank chamber, B, which also encloses the differential gear on the countershaft, E. The feed-water pumps, F, are fixed on the right-hand side of the car and are formed in one casting. One of them is operated by the hand lever, F^2, and the other by the eccentric, F^1, on the countershaft, E. An air pump, D, is fixed to the left of the engine, and is driven by a crank-pin on that end of the crankshaft. The

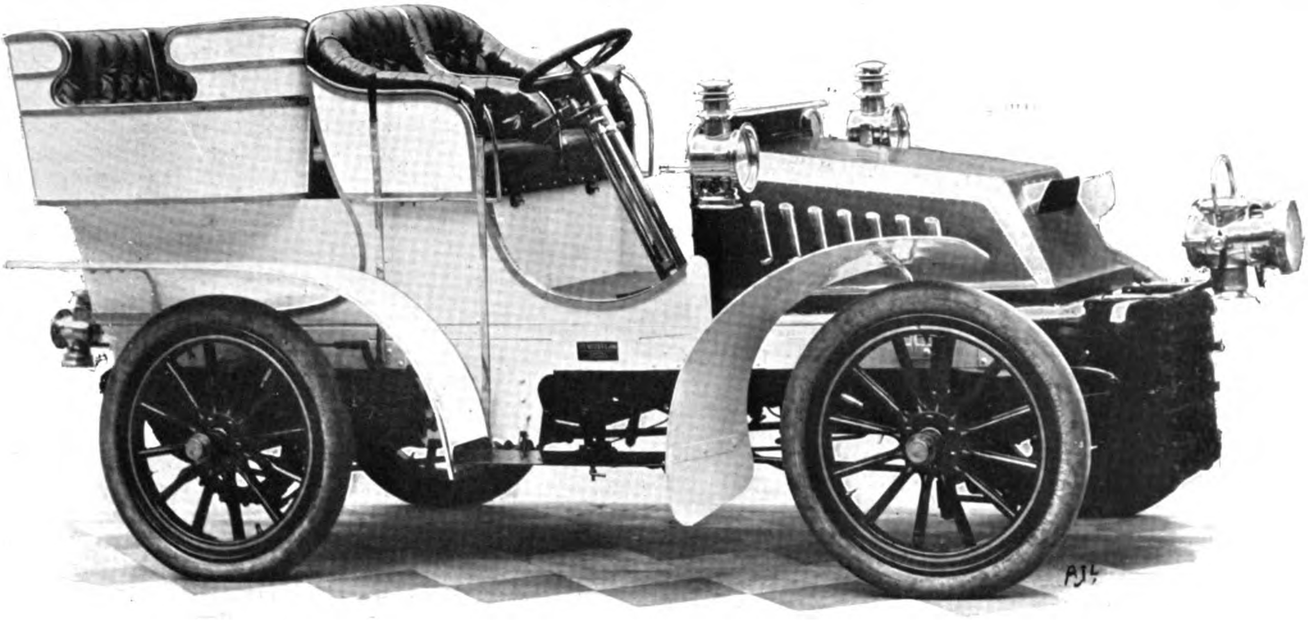


FIG. 1.—A 10-h.p. Miesse Steam Car.

other end of the shaft carries a brake-drum, the band, X¹, of which is controlled by a foot pedal, X². The cut-off of the engine and its direction of rotation are varied by sliding the two cam-shafts which operate the admission and exhaust valves longitudinally, this being done by the horizontal lever, C, on the steering pillar. The lever, C, which moves over the quadrant, C¹, is shown in Fig. 5 in its "reverse" position. When moved to its central position no steam is admitted to the cylinders, and when moved to the right various degrees of cut-off, in a forward direction, are obtained. The forks which slide the cam-shafts are carried on a vertical spindle, C³, by means of the lever, C², fixed to its upper end. The crank-chamber is lubricated from the oil tank, T, on the dash by

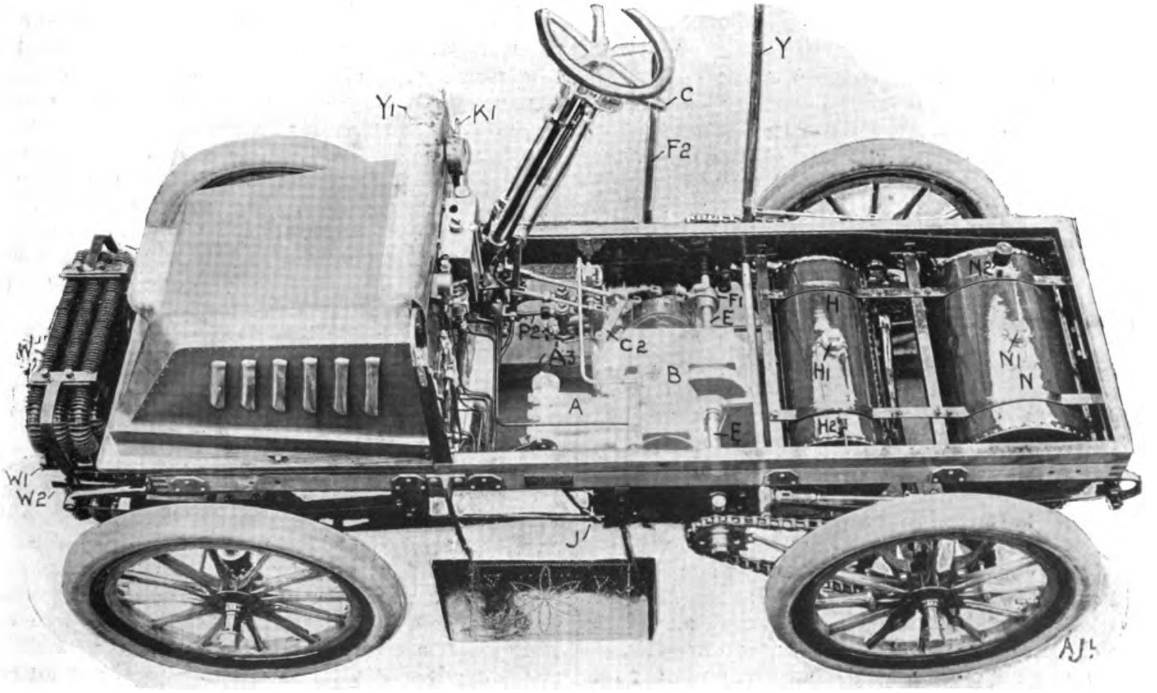


FIG. 2.—The Miesse Chassis from above.

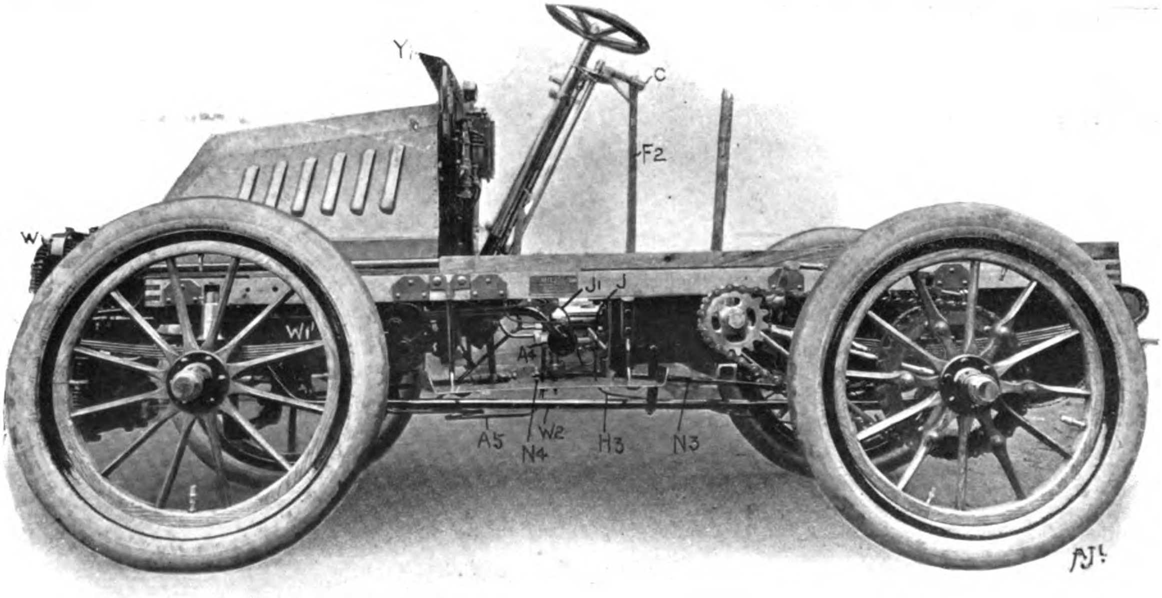


FIG. 3.—The Miesse Chassis.—Left side.

means of the hand pump, T^1, alongside it, the oil being conducted to the engine by the pipe, T^2. An automatic lubricator, U, of the Rochester Pony type, is operated by the eccentric, F^1, which drives the feed-water pump, and the oil delivery from it is conducted into the crank-chamber by the pipe, U^1.

The water-tank, N, has a filling cap, N^1, arranged centrally. The water is led from the tank by the pipe, N^3, to the feed pumps, F, and its passage to the pump cylinders is regulated by a shut-off cock, N^4. A drain-cock is also fitted beneath the shut-off cock to enable the tank to be emptied. A small dome, N^2, is placed on the top of the tank on the right-hand side, and an overflow pipe, which passes down through the water and out at the bottom of the tank, terminates at its upper end inside this dome.

One of the delivery pipes, P^2, from the pumps is led to a by-pass valve, R, which is also connected back again to the suction side of the pump. The by-pass is controlled by the small hand wheel, R^1, on the steering pillar, and the quantity of water delivered to the boiler can thus be regulated. The delivery pipe, P, from the pumps to the boiler, has an additional non-return valve between it and the

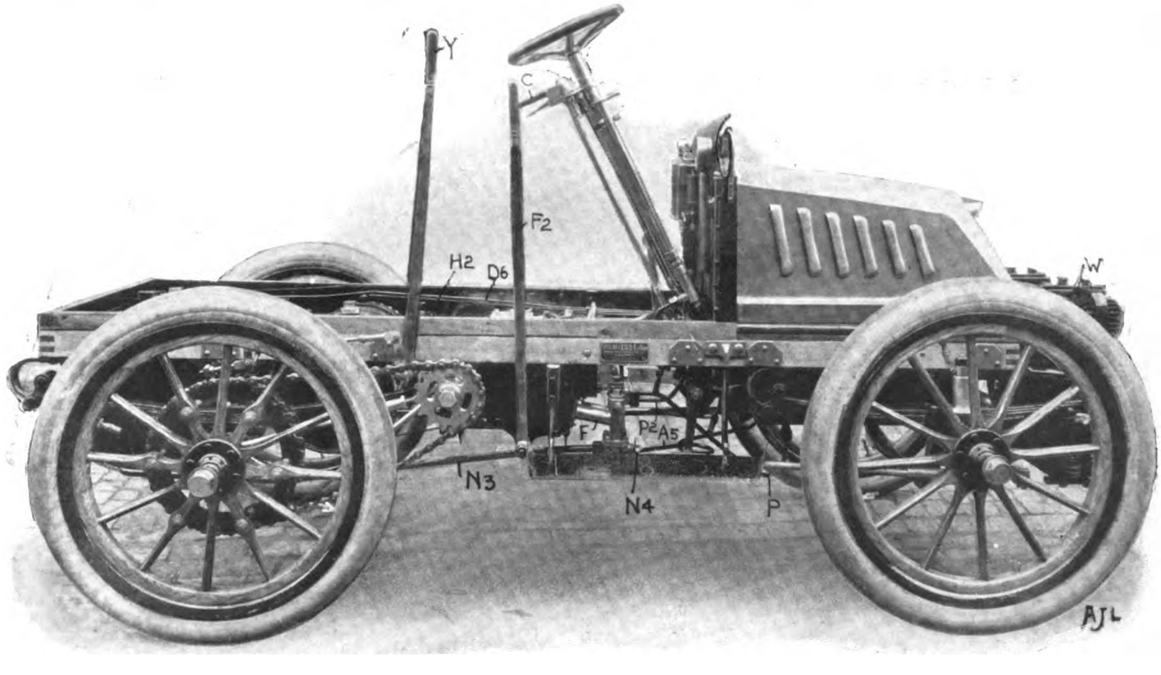


FIG. 4.—The Miesse Chassis.—Right side.

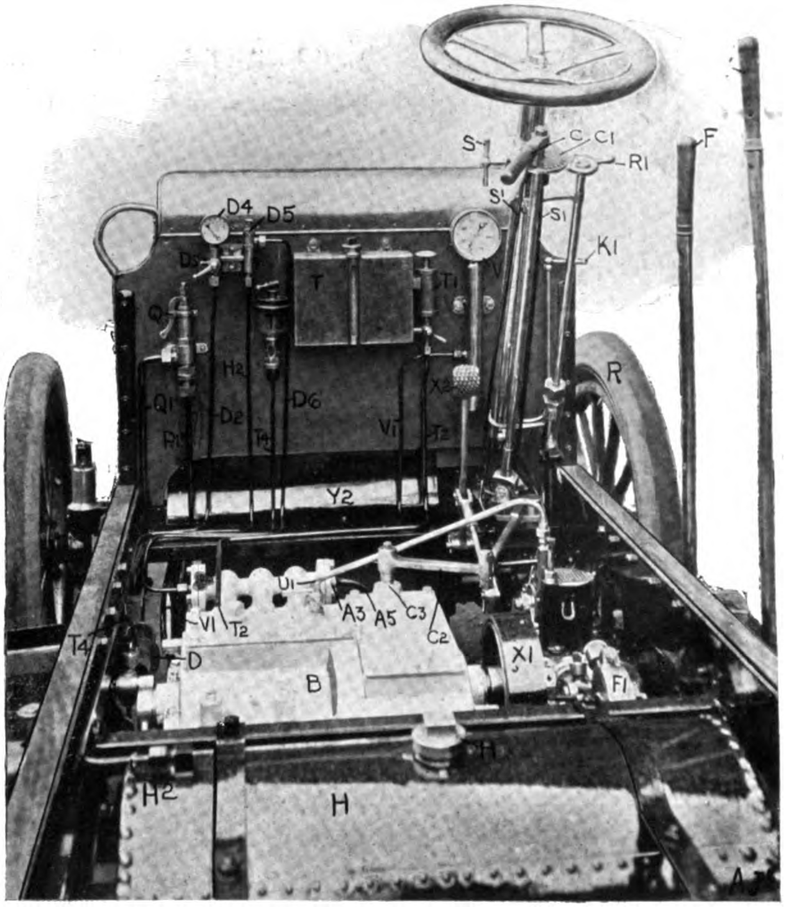


FIG. 5.—View of Miesse Chassis, showing Controlling Levers, Lubricators, and Gauges.

pumps. It passes direct to the bottom coil of the generator, and has two branch pipes, the one of which, S^1, leads through a relief-valve, S, on the steering pillar, and the other to the safety-valve, Q, on the dash. The relief-valve, S, is normally kept closed; but, in the event of the pressure rising abnormally at any time, it can be opened by the driver, when the water or steam in the pipe, P, will be allowed to pass to the condenser. The overflow pipe, Q^1, of the safety-valve is also taken to the condenser.

The main steam pipe, A^6, from the generator to the engine, is of very small diameter; it leads to the admission-valve chamber on the top of the cylinder casting. When a throttle-valve is provided, it is fitted close up to the valve-chamber; no throttle-valve, however, was provided on the chassis from which we took our photographs. A small pipe, V^1, is taken from the opposite end of the valve-chamber up to the steam-pressure gauge, V, on the dash. This gauge is of special construction in order to prevent the needle from vibrating, in consequence of rapid variations in the pressure. For this purpose it is provided, beneath the dial, with an air and water cushion, which acts as a kind of dash-pot.

The exhaust steam is conducted by the pipe, W^1, to the radiator, W, in front. The radiator is of the Loyal pattern, and has three banks of tubes arranged in parallel with one another. The steam enters the top tubes and passes down through each successive layer to the bottom, the condensed water being forced by the pressure of the exhaust steam out through the pipe, W^2, and back to the water tank, N. This pipe passes up through the bottom of the tank and terminates above the normal level of the water in it. Any uncondensed steam which may find its way into the tank goes across the surface of the water into the dome, N^2, and down the overflow pipe.

Ordinary lamp oil, which is used as fuel, is carried in the air-tight tank, H. The tank is filled through the removable cap, H^1, and the feed-pipe, H^3, from it is led to a shut-off cock, J, on the left-hand side of the car. A pressure of about 60 lbs. per sq. in. is maintained in the tank by the mechanically driven air pump, D. The delivery pipe, D^2, from the pump, is led to a three-way cock, D^3, which is connected with a pressure gauge, D^4, and with a relief-valve, D^5, on the dashboard. The three-way cock, D^3, has a nozzle to which can be attached an ordinary tyre pump for obtaining the necessary pressure initially. The cock allows the driver (1) to place the nozzle in communication with the pipe, H^1 (leading back to the top of the fuel tank), (2) to put the nozzle in communication only with the delivery pipe, D^2 (from the air pump), or, alternatively, (3) to put the delivery pipe, D^2, in communication with the pipe, H^2; the last-mentioned position being that required normally when running. The gauge, D^4, indicates the pressure in the tank, H, and the relief-valve, D^5, is set to blow off at a pressure of 60 lbs. per sq. in., when it allows any surplus air to escape through the pipe, D^6, to the atmosphere. The piston of the air pump, D, is independently lubricated through the pipe, T^4, from the sight-feed lubricator, T^3, on the dash.

When the cock, J, is opened, the fuel finds its way through the vaporiser coils and the regulating valve to the burner nozzle. The quantity of gas which is fed to the burner is regulated by a hand lever, K^1, on the dash. One of the coils of the burner is initially heated up by a blow-lamp, and both coils are subsequently kept hot by the burner itself.

The usual double-acting band brakes are fitted to each of the side wheels, and are operated by the hand lever, Y. The dashboard is formed of two sheets of metal and is hollow. It is provided with a curved deflector plate, Y^1, at the top, and with a similar deflector, Y^2, at the bottom. When the car is travelling, air finds its way down through the dash, and passes around the cylinders of the engine. The front end of the flue, leading the burnt gases from the boiler, down between it and the dash, is seen in some of our illustrations. It is open in front to the air, and the burnt gases pass out beneath the car. The steering gear is of the usual type, a worm and segment being used to render it irreversible. The ordinary distance rods are also fitted between the countershaft and the rear axle, and thrust rods from the band-brakes also pass up to the brackets carrying the ends of the countershaft.

(*To be continued.*)

THE 12-H.P. "SUNBEAM" PETROL CAR.

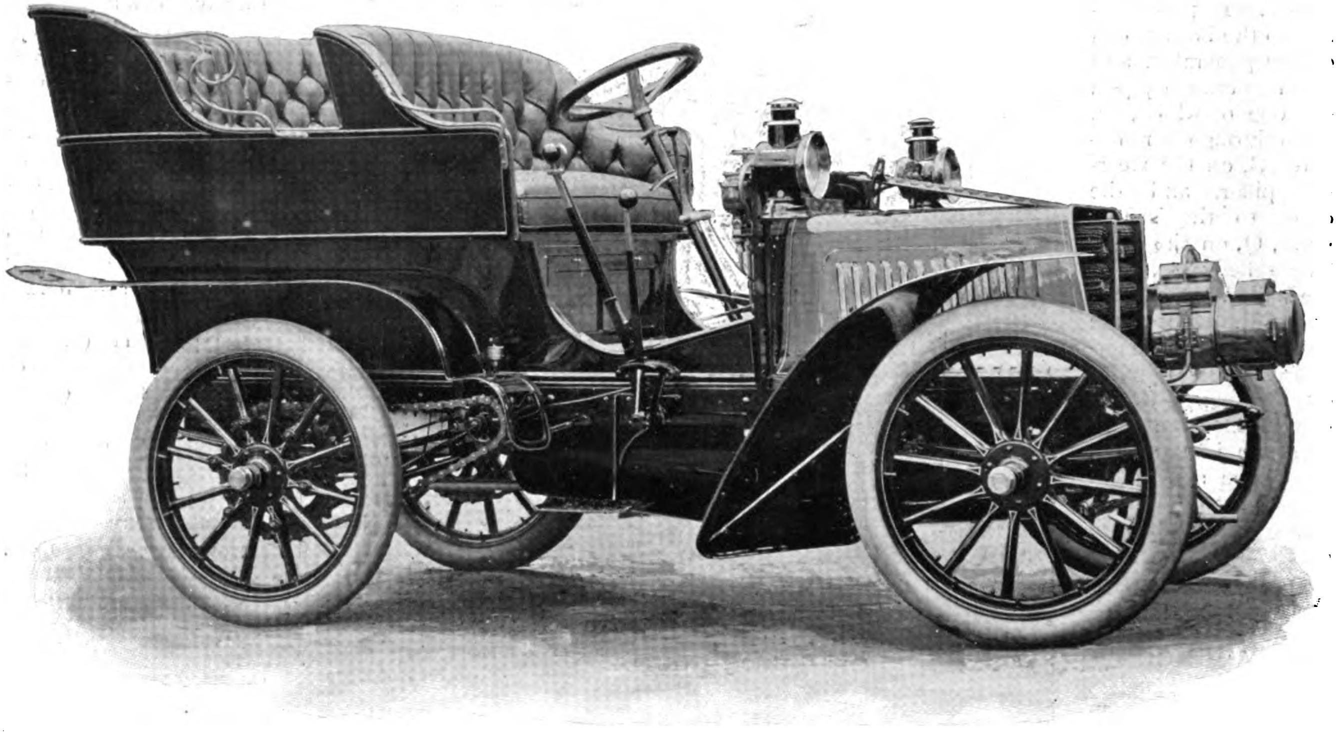


FIG. 1.—A 12-h.p. "Sunbeam" Car.

WE have already referred to the 12-h.p. Sunbeam car which has been put on the market by John Marston, Limited, of Wolverhampton, and we called particular attention, when describing the exhibits at the last Show at the Crystal Palace, to the exceptionally fine finish of the carriage work on this vehicle. We recently paid a visit to the Company's works, and found that they had been largely extended to enable them to cope with the demand for this larger vehicle, as well as for their already well-known little "Maberley" cars, with which they have done so well in the past. The Company are now manufacturing the greater part of their "Sunbeam" cars themselves, although many of the small repetition parts, and the metal work for such portions as the bonnets and tanks, are made by them in their other works in the town. They do not, however, build the motors themselves at present, but have selected a well-made engine, which they subject to careful testing before fitting.

The automobile works are equipped with all the necessary plant for manufacturing the cars and with special shops for building the bodies and for painting and finishing them. The illustrations which we give serve to convey a good general idea of the work which is carried out, although it has been impossible for us to give views of all the various departments. The machine and erecting shop is illustrated in Figs. 2 and 4, and a part of the body shop in Fig. 3. The works are conveniently arranged for their purpose, and have exits of sufficient width for cars to pass in and out both to the road in front and to a road behind. It will be noticed that a large number of the 12-h.p. vehicles were in course of construction at the time of our visit, and Fig. 2, in particular, allows several partly-finished chassis to be seen. We do not propose to say much about the works themselves, although they are well fitted up with suitable machinery and are of considerable size; but we particularly noticed the care which is taken to ensure the high degree of finish which is such an attractive feature of these vehicles. The paint shop is fitted with a large screen suspended from a wooden framework which can be lowered down or raised up out of the way. When let down the screen entirely encloses the car and prevents any dust from reaching it during the drying process. The shop itself is rendered as draught-proof as possible, and is kept scrupulously clean.

The "Sunbeam" cars, one of which is seen in Fig. 1, are built on thoroughly well-known lines, and do not, therefore, need any very detailed description. A plan view of the chassis is seen in Fig. 4, and a side view in Fig. 5. The main frame is built of ash and steel. The engine and the change-speed-gear are carried upon a separate underframe, which is made out of angle steel of unusual section. The steel is of greater depth than usual, although the width remains the same; it would therefore be able to withstand a greater weight carried upon it. A light sheet metal casing entirely encloses the engine and the gearbox on the under side, and this is rendered dustproof in front by a leather flap which can be let down in order to inspect the commutator or other parts of the engine in front. The mechanism and the regulating levers are so arranged that the bodies can be entirely removed without disturbing them, the only connection between the frame and the body,—other than the bolts holding them together—is formed by the petrol pipe leading from the petrol tank beneath the front seat down to the carburettor. All the floorboards are also removable and consequently every part is readily accessible. The water tank is fitted with a large pipe leading outside the frame and allows it to be filled without interfering with any part of the body.

The engine has four cylinders cast in pairs; they have a bore of $3\frac{3}{16}$ ins., and the stroke is $4\frac{11}{16}$ ins. The normal

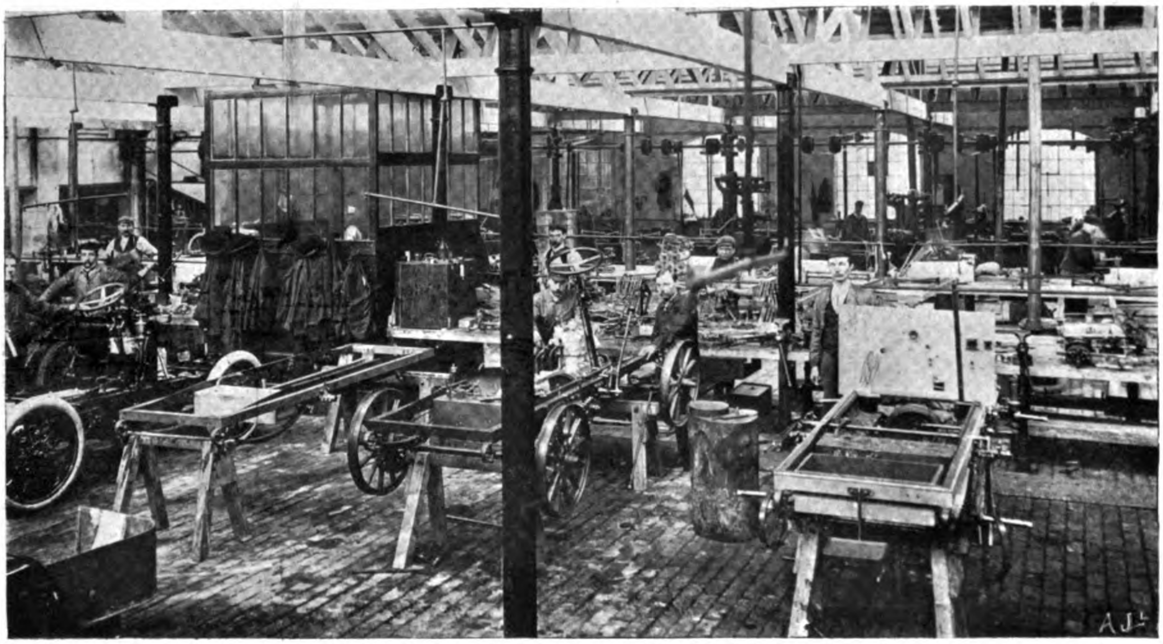


FIG. 2.—Part of the Machine and Erecting Shop.

speed is 800 revolutions per minute, and its range of speed is from 100 to 1,000. The inlet valves are atmospherically operated, and are so arranged that they can be removed without disconnecting the pipe leading from the carburettor to them. It is only necessary to unscrew a plug above either of them in order to lift it out complete with its seat. The cam-shaft operating the exhaust valves is enclosed in the crank chamber, and a centrifugal governor and the commutator are mounted on its forward end. The carburettor is of the Company's own special design and is in general respects similar to others of the float-feed spray type. The throttle-valve forms a part of it, and is of a cylindrical plunger form. It is connected with the governor and is inter-connected with an accelerator foot pedal and with a hand-lever on the steering pillar, which regulates the normal speed. The time of ignition can also be regulated from a lever on the steering pillar. The engine is lubricated by a belt-driven mechanical lubricator on the dashboard. Four separate exhaust pipes lead to an exhaust box placed alongside the engine, and the burnt gases are allowed to escape through a pipe passing from it to the back of the car. The cylinders are water-cooled, and a centrifugal pump is used for circulating the water around them, and through a radiator of the Loyal type in front of the bonnet.

The change-speed-gear is shown, taken apart, in Fig. 7. It is operated by a single side lever, which can be moved forward or backward in either of two slots in the quadrant in order to obtain the four forward speeds. When moved into a third slot, which is normally locked by a small catch, the "reverse" gear can be introduced by it. Referring to Fig. 7, the first-motion-shaft, A, is shown in position in its bearings in the base of the gear case, and the male portion, B, of the main friction-clutch, together with the spring, B¹, which

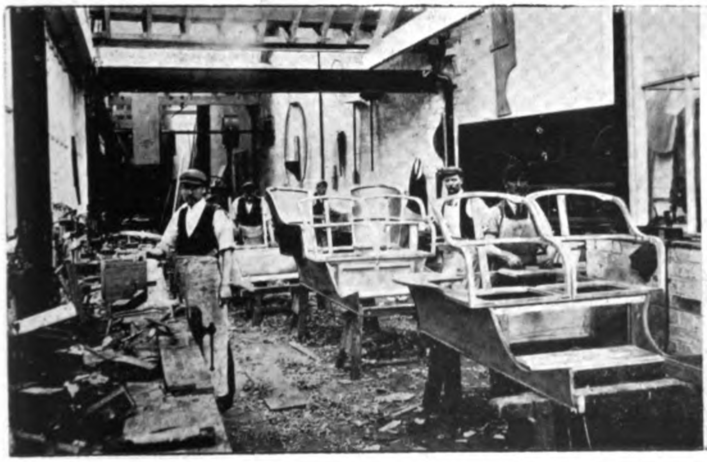


FIG. 3.—Part of the Body-Making Shop.

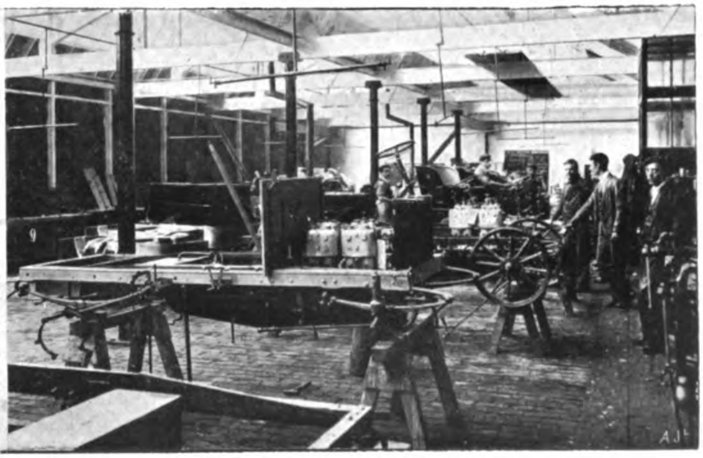


FIG. 4.—Part of the Erecting Shop.

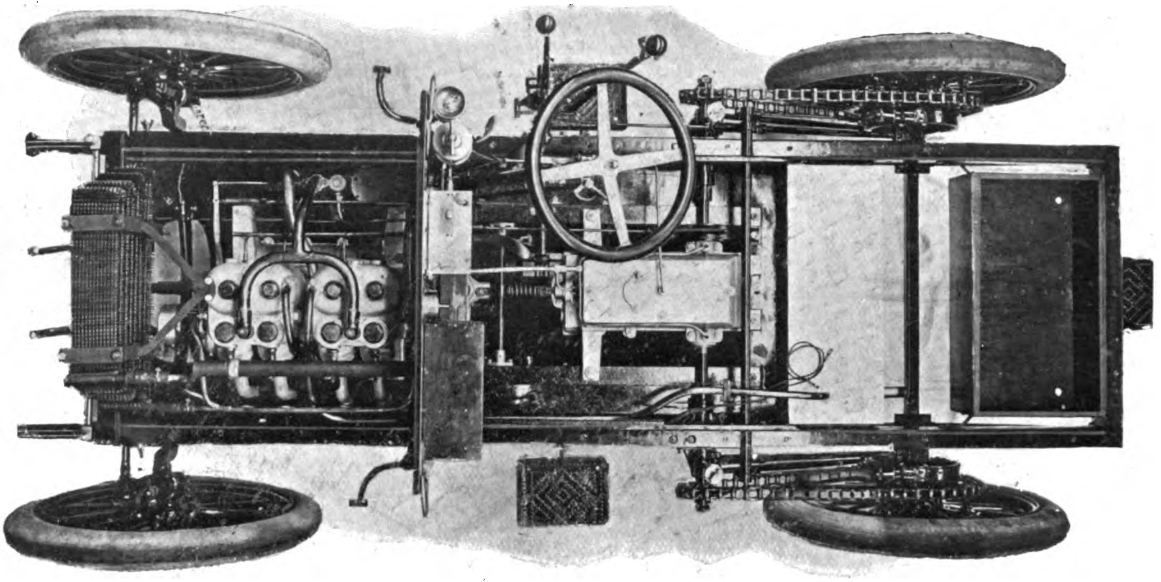


FIG. 5.—Plan View of "Sunbeam" Chassis.

normally holds it in engagement, are seen in their places. It will be noticed that three sliding bars, C, C^1, and C^2, are fitted in the casing, and that each of these is provided outside the box with projections for the change-speed lever to engage in. The bar, C, has a fork, D, which engages with the sliding spur-wheels, A^1 and A^2, mounted upon a squared portion of the first-motion-shaft, and it therefore allows either the first or the second forward speed to be brought into play. The bar, C^1, has a fork, D^1, which engages with the spur-wheels, A^3 and A^4; it therefore brings in either the third or the fourth speed. The bar, C^2, has a fork, D^2, which engages with an intermediate spur-wheel, E, and brings it into mesh with the low-speed wheels in order to give a reverse. The second-motion-shaft, F, carries the spur-wheels, F^1, F^2, F^3, and F^4, which correspond with the wheels on the first-motion-shaft, D^1, D^2, D^3, and D^4, respectively. The second-motion-shaft is shown in position in the intermediate casting of the gear-box, and it carries the bevel wheel, G, at its forward end, which meshes with the corresponding wheel, H, on the differential gear, H^1. The two halves of the countershaft, J, receive flexible couplings at their outer ends through which the power is taken to the sprocket wheels in the usual way. The brake-drum, K, on the countershaft is provided with a metal brake-band, and forms a powerful double-acting brake. The casting shown to the right at the top of the illustration fits

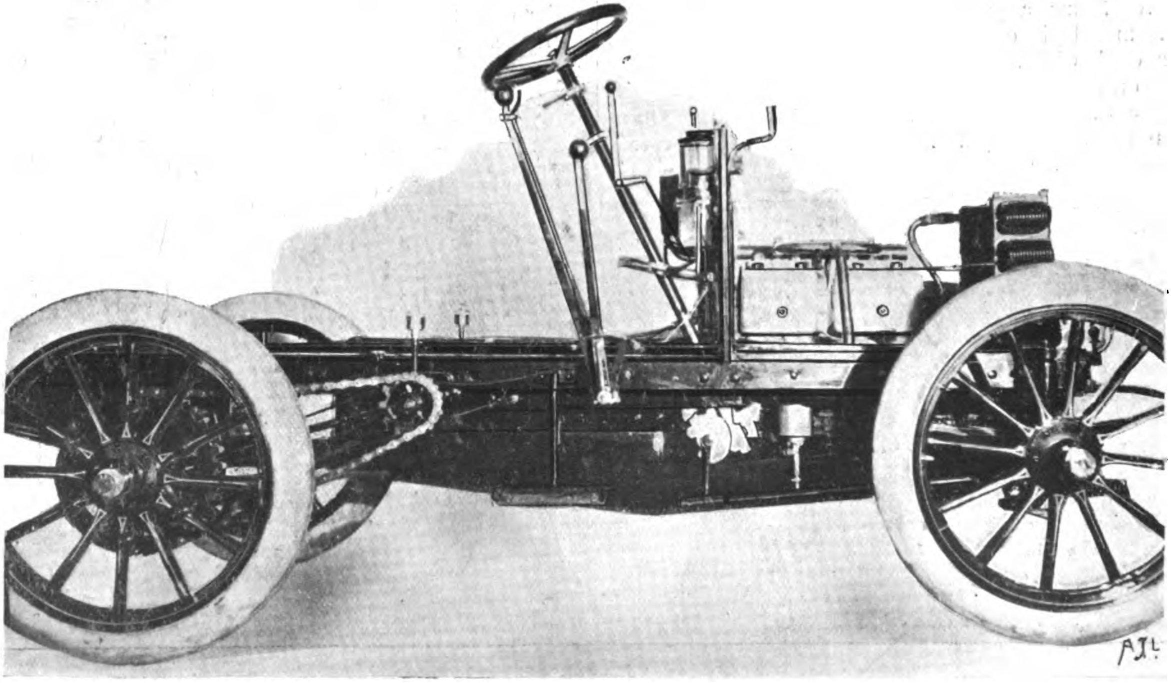


FIG. 6.—Side View of "Sunbeam" Chassis.

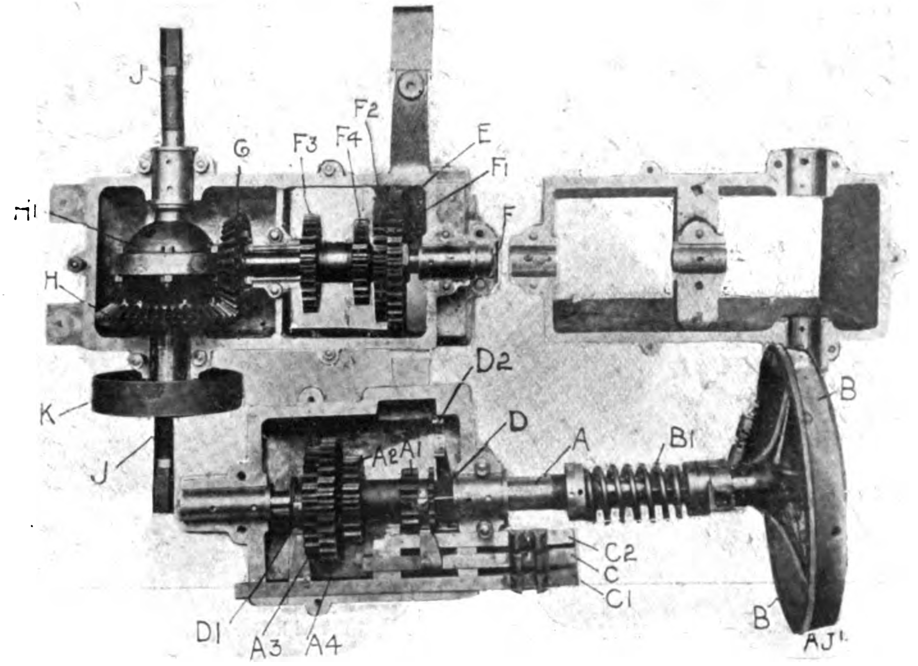


FIG. 7.—The "Sunbeam" Change-Speed Gear dismantled.

over the part containing the second-motion-shaft, and is itself provided with a large flat inspection cover on top. The gear-box is lubricated from the dashboard, and the oil contained in it is circulated by the revolving wheels, the parts being so shaped that it finds its way from the top casting down to the various bearings. A grease lubricator on the dash is also connected by pipes with the bearings, but is used more to prevent dust from getting into the bearings than for lubricating the gear wheels.

The usual side brakes are fitted, these being as usual controlled by the longer lever seen beside the driver's seat; their brake-bands are lined with camel-hair belting, and are of large diameter.

The Company are only building this one size of large car this year, and have devoted their energies to making it as satisfactory as possible. It is strongly constructed, as well as being well finished, and it should meet the requirements of a large number of motorists.

THE MOTOR VOLUNTEERS.—The Secretary for War has officially approved of the following special grants to the Volunteer motor corps. In lieu of all grants given to ordinary Volunteer corps, a capitation grant of 40*s.* for each efficient officer and a capitation grant of 40*s.* for each efficient member; a capitation grant of 50*s.* for each proficient officer and sergeant; an allowance of 30*s* a day, not exceeding ten days, for each day of attendance of any officer or volunteer on duty with his car, and, where fuel is not obtainable from the stores of the Army Service Corps, a further allowance of 30*s.* a day, which is also to cover wear and tear of the machines. An advance of three-fourths of the capitation grant will be made as members are enrolled to cover cost of uniform and initial expenses, the recovery being spread equally over the next three years. The headquarters will be at Sanctuary Chambers, Westminster, and the establishment of the corps has been fixed at 203 officers and men, including an adjutant and two sergeant-instructors. The uniform will probably be drab in colour, and a flat-topped peaked cap will be worn.

PREPARATORY to the opening of the London County Council electric tramway system in South London, a number of the County Council's horse drivers have been passing through a regular course of tuition in driving the new cars. 160 drivers have successfully passed the car-driving tests, the teacher at the motor car school saying he had never had better material to work upon, four only having failed. The jeering remarks with which at one time all automobiles were greeted by omnibus and other drivers are now almost a thing of the past, and the above-mentioned facts should do away with the last glimmering of prejudice of the drivers to mechanical traction, as without question this class of man, with very little training, should be available to transfer their services to the driving seat of the automobile as a perfectly natural course. Tramway motor cars, no doubt, are not so difficult to handle as an ordinary motor car, but the same class of man who is able to handle the one should have no difficulty in going a step further and managing the other.

THE Ormskirk and Southport Agricultural Society have decided to make a class for their next Show for the neatest and best appointed motor car. A sign of the times, indeed.

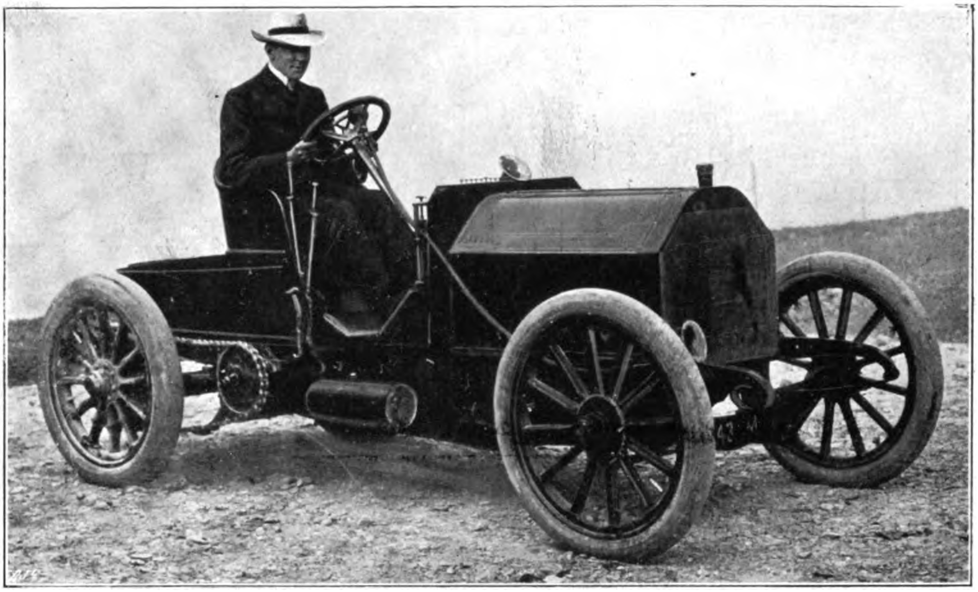


FIG. 1.—The 1903 type 60-h.p. Mercedes Car, fitted with Racing Body.

THE 1903 60-H.P. MERCEDES CAR.

THE new 60-h.p. Mercedes racing car, with Mons. Degrais driving, is shown in Fig. 1, and a view of the engine in the car, with the bonnet removed, is shown in Fig. 2. As we have before mentioned, the general design of this machine is precisely similar to the 18–22-h.p. car, the latest illustrations of which we gave last week.

Very little further information concerning these cars is as yet available, but we learn that the change-speed-gear, which we illustrated on January 24th, has been again altered in both the 18 and 60-h.p. vehicles. The Company have now decided to abandon the use of the cam-plate for bringing the different gears into engagement on these cars, and have only retained it on the 90-h.p. machine.

The arrangement of the lever is now the same as it was

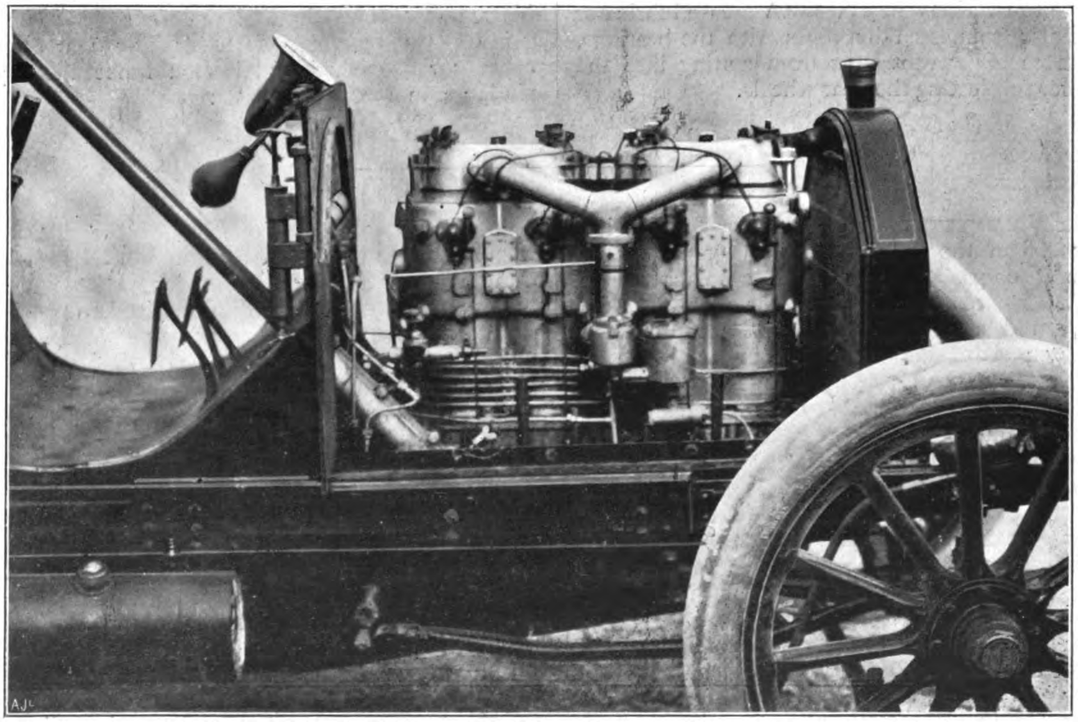
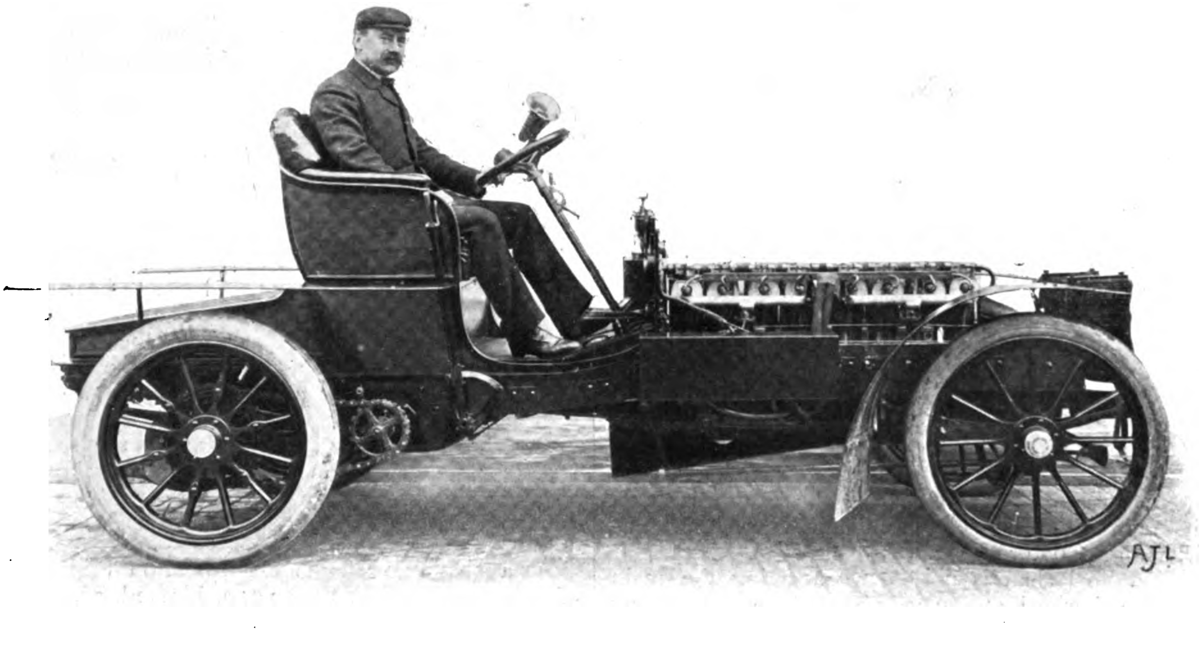


FIG. 2.—The Engine in the 60-h.p. Mercedes Car.

last year, and is not fitted so as to be moved progressively forward and backward over a single quadrant for all forward speeds and the "reverse." It will be remembered that in previous models the lever is moved forward and backward, to one of two alternative positions only, in alternative slots, and is free to move sideways when in a vertical position. One of the advantages of this earlier arrangement is that it prevents the novice from missing a gear by "running through" it when changing from one speed to another, and it is interesting to notice that the Cannstatt firm have returned to it after having given the more fashionable method a trial.

TRIAL OF THE 8-CYLINDER CHARRON-GIRARDOT-VOIGT CAR.

The 8-cylinder C. G. V. motor, which was described and illustrated in The Automotor Journal, Jan. 3rd, in connection with the last Paris Salon, has now been fitted upon a car, and given a run through Paris. The result of the trial is said to have been eminently satisfactory. M. Georges Prade, of *L'Auto*, who accompanied M. Girardot, who is seen on the car in the illustration which we reproduce above, described the running of the vehicle as being extraordinarily smooth and quiet. He compares it, in fact, to a Serpollet car, both for absence of noise and for quietness, ease of starting, and regularity in running. The control of the engine is effected by two small hand levers on the steering pillar below the steering wheel, one of which regulates the time of ignition and the other the amount of mixture. In addition to these levers there are three foot pedals, two of which are the ordinary pedals for the clutch and brake, and the other controls the admission of the mixture. There is no change-speed gear whatever, the engine driving through a longitudinal-shaft and main clutch direct on to a differential counter-shaft, from which the power is transmitted to the road wheels by side chains. The 8-cylinder motor is capable of developing 40-h.p., and the car was tried at every speed from just moving after starting up to a speed of 80 kiloms. an hour, which it accomplished with ease. At all speeds there was, according to M. Georges Prade, absolute silence. Nothing could be heard but the whirr of the road wheels and chains. The car has a total length of 3½ metres, a wheel base of 3 metres, and a track of 1·34 metres. The total length of the motor is 1·4 metres, and that of the bonnet 2·10 metres. Satisfactory as the trial appears to have been, we understand that the Company will provide a change-gear having two speeds on the cars of this class which they are to put upon the market. The first speed will give up to 35 kiloms. an hour, and the second from 35 to 80 kiloms. We assume, therefore, that for very steep hills, or for starting on an up grade, experience with the existing vehicle has shown the lower gear to be advisable.

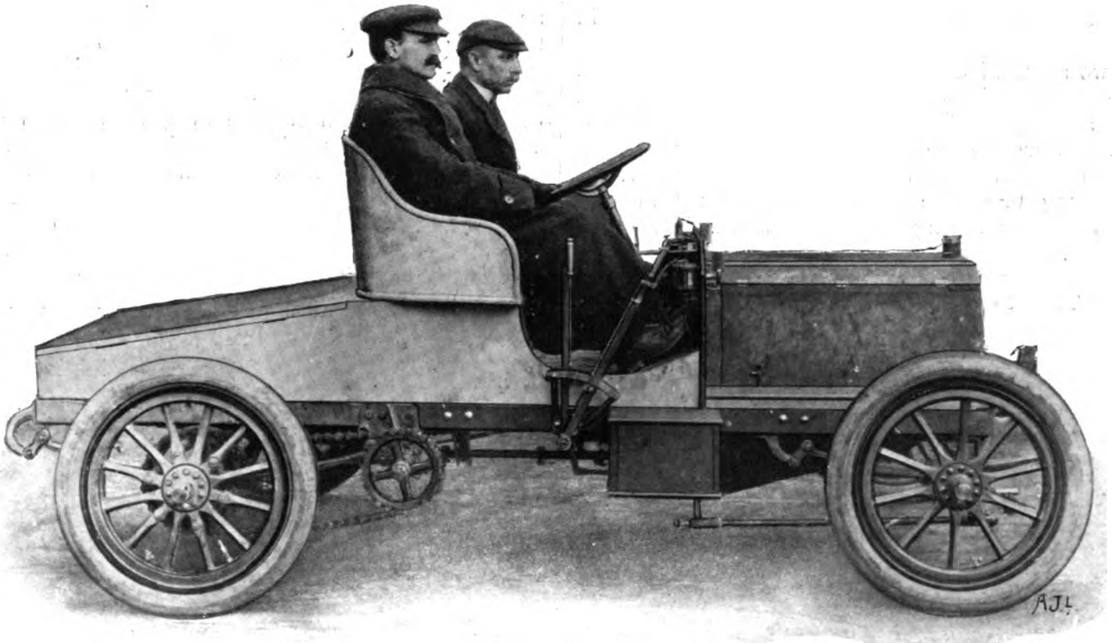


The C. G. V. 8-Cylinder Car with Bonnet removed.

Air-Cooled motors are rapidly gaining favour in the United States, according to the *Chicago Motor Age*. This statement, however, hardly appears to be borne out by figures published by *Automobile Topics* in analysing the Chicago Automobile Show exhibits, as out of 141 petrol vehicles only six were air-cooled.

Automobile fire engines, hose carriers and hook and ladder trucks are to be made special features of at the St. Louis World's Fair. The large aeronautical prizes offered will also probably bring forward a number of competitors; amongst these being Leo Stevens, whose exploits in America we recorded some months back. He has, it is stated, secured a lease of Cayuga Island, about three miles below Niagara Falls, where he intends to construct an air-craft, using a petrol-turbine, the invention of Frederick Montgomery, of Buffalo, for operating the propelling mechanism of the air-ship. Austin Corbin, a New York banker, is stated to be associated on the financial side of the scheme.

THE NEW 14-H.P. BROOKE LIGHT PETROL CAR.



The 14-h.p. Brooke Car with Racing Body.

Our illustration shows the new light car built by Messrs. J. W. Brooke & Co. It is at present fitted with a rough racing body, and will be shown with it at the Agricultural Hall Exhibition this week. The 3-cylinder engine with which it is fitted was illustrated by us on February 21st, when we also gave drawings of the automatic governor and carburettor used with it.

The method of transmission is, as before stated, considerably altered in this new model, and the engine is fixed with its crank-shaft lying longitudinally, instead of transversely, as in the other Brooke cars.

A longitudinal shaft is used for connecting the main clutch in the flywheel of the gear-box. The change-gear provides three forward speeds and a reverse, a direct through drive to the bevel wheel driving the differential countershaft being obtained on the top speed. The sprocket wheels on the countershaft are almost as large as those fixed to the rear wheels, and roller chains of 1¼-inch pitch are used. The wheels are 30 inches in diameter, and have Dunlop tyres.

The wheel base of the car is 7 feet 6 inches, and the track is 4 feet 8½ inches. The main frame of this first car is made of wood, but they will in future be constructed of stamped steel. The distance between the frame and the road is unusually small.

The engine, which, it will be remembered, has mechanically-operated inlet valves, gives 14½ b.-h.-p. at 900 revs. per min., the cylinders are lubricated from a Dubrulle feeder on the dashboard, and the coils and the commutator are also fixed to the dash. The commutator is controlled by a hand-lever working over a toothed quadrant on the steering pillar, much as on the Napier cars. The switch is also fixed to the steering pillar, and the wires are led to it through tubes.

The throttle-valve can be controlled by hand, and provision is made for opening the exhaust direct to the air when desired, thus enabling the driver to hear whether the engine is working regularly.

A square radiator forms the front of the bonnet and the air is drawn through it by fan blades in the flywheel. The foot-boards are fixed in a sloping position, as in the Mercedes cars. The pedals are mounted so that they are operated by being pushed forward by the foot, and the levers for the change-speed gear and side-brakes are fitted so as to be drawn towards the driver. The car weighs about 15 cwt., and runs at speeds of over 45 miles per hour.

* * *

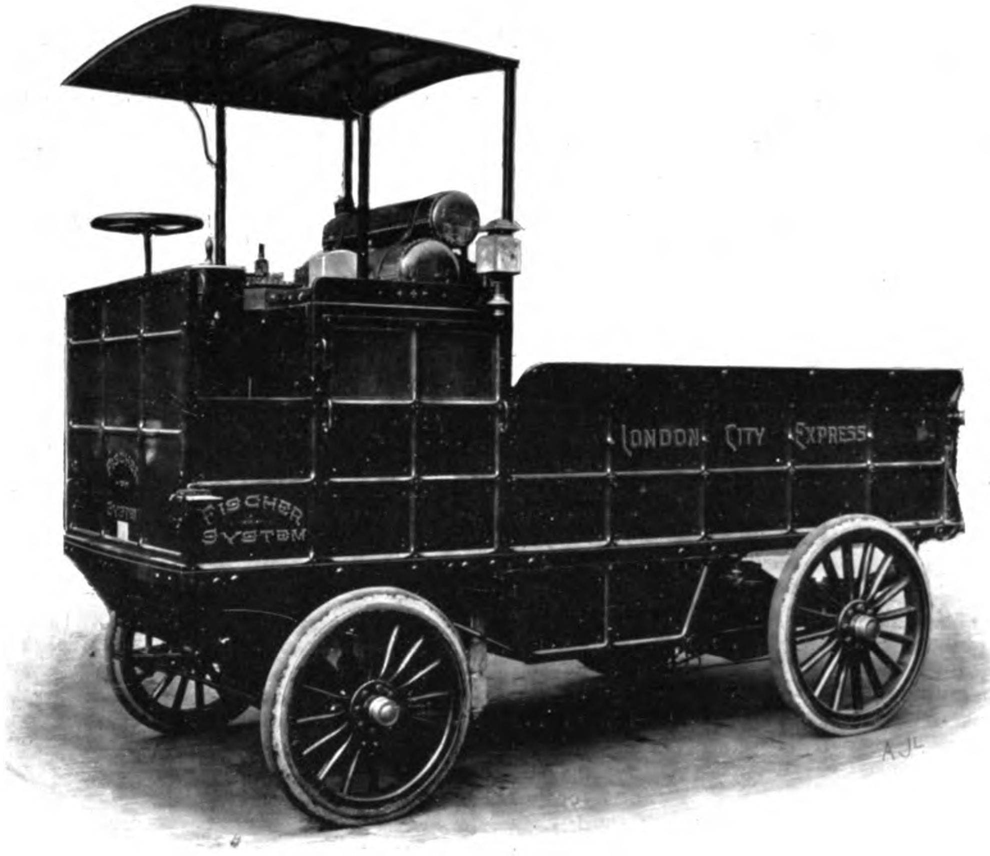
At a meeting of shareholders, held on Friday, the 14th, of Messrs. Frank F. Wellington, Limited, 36, St. George's Square, Regent's Park, N.W., dividends were declared at the rate of 6 per cent. on Preference Shares and 7½ per cent. on the Ordinary.

The advantages of using unburstable inner tubes with pneumatic tyres was forcibly demonstrated by a curious accident which occurred to Dr. Corbould, of Kensington, last week, when his car was run into by a brougham. The outer cover of one wheel was partly torn out of the rim, exposing a considerable piece of the inner tube, besides doing other damage to the car. The tyre was apparently unhurt by the accident after the cover had been replaced and the tube, which was a "Rucker," re-inflated.

Remembering the time when anything connected with automobilism was greeted in the general Press with scorn and ridicule, it is extremely amusing to watch the manner in which the newspapers are almost one and all publishing "Special Motor Car Supplements" upon all and every occasion when opportunity offers in the shape of automobile exhibitions, &c., "to meet the exigencies of the increasing importance of the automobile industry." To pocket some of the automobile manufacturers' money for advertisements would perhaps be nearer the true explanation.

THE FISCHER 1-TON PETROL-ELECTRIC TRUCK.

WE have already dealt very thoroughly with the question of combined petrol-electric systems, in which the engine drives a dynamo and runs at an approximately constant speed under all conditions, and in which the road-wheels are driven by electric motors, the current for which is supplied more or less directly by the dynamo. The Fischer system, in particular, has been fully described in our columns, and we have on more than one occasion published illustrated articles in which the details of construction, both of the omnibus, which has been a familiar sight in London, and of the heavy goods wagon, have been set forth.



The Fischer 1-ton Petrol-Electric Truck.

One of the latest arrivals from America is the 1-ton truck shown in the accompanying illustration, and it is, in our opinion, the most satisfactory of those which we have as yet seen. It is of considerably lighter construction than before, and is of a very useful size for carrying loads of about one ton. As will be seen, it is fitted with a dray body having sides to it, and the tailboard hinges down in the usual way for loading and unloading. It is true that a considerable amount of space is taken up in front by the driver's seat, the engine, the dynamo, and the water and petrol tanks; but, as against this, it should be pointed out that easy access to the machinery is secured by the arrangement.

Our second illustration shows the 3-cylinder engine in position beneath the seat; the fan on the rear end of the crank-shaft, and the circulating pump, which is frictionally driven off the flywheel, are also prominent in this reproduction. Such a view of the machinery can be obtained by merely removing the large panel which forms the side of the seat, and a similar door is arranged on the other side. The dynamo is coupled direct to the front end of the crank-shaft, and therefore lies beneath the floor in front of the seat. The engine and dynamo are fixed on a common bed-plate, which is in turn secured to cross-members of the main frame.

The 3-cylinder engine is capable of developing 10-h.p., and normally gives about 7-h.p., at a speed of about 600 revolutions per minute. Its power and speed are regulated by varying the time of ignition and by a throttle-valve. The throttle-valve is provided with a magnetic control, the solenoid of which is arranged in series between the dynamo and the accumulators. By this arrangement the speed of the engine is, to a certain extent, automatically governed, and the quantity of current supplied by the dynamo to the cells is kept constant.

The dynamo is multipolar and has an output of 5 kilowatts. Its normal E.M.F. is about 110 volts, there being 50 cells arranged in series to form the battery. The accumulators are of the P. V. Chloride type, and have a capacity of about 67½ ampère hours at a three-hour rate of discharge. The engine normally charges them at the rate of 50 ampères, and the maximum discharge rate may be something like 150 ampères for short periods on exceptionally steep hills.

The rear axle is divided centrally, and each half is carried in two bearings in a substantial framework. No differential gear is needed, as two separate motors are employed, one of which drives each half-axle The inner ends of the half axles carry spur-wheels, and corresponding pinions on the motor shafts mesh with them. The output of each motor is 2½ kilo-watts; they are series wound. The connections which are made by the controller between the accumulators and the motors give five forward speeds besides "reverse" speeds. In the 1st forward notch the motors are put in series with one another, and a resistance is introduced in the circuit. In the 2nd notch the motors are still in series, but the resistance is cut out. In the 3rd position the fields are in parallel with one another, and the armatures in series with each other and with them. In the 4th notch the armatures are in parallel and the fields in series with one another and with the armatures. In the 5th position the two motors are in parallel with one another.

For starting the engine, a switch is provided, by which the accumulators are connected with the dynamo through a resistance; after starting, the resistance is, of course, cut out. An ammeter and voltmeter are fixed beside the driver.

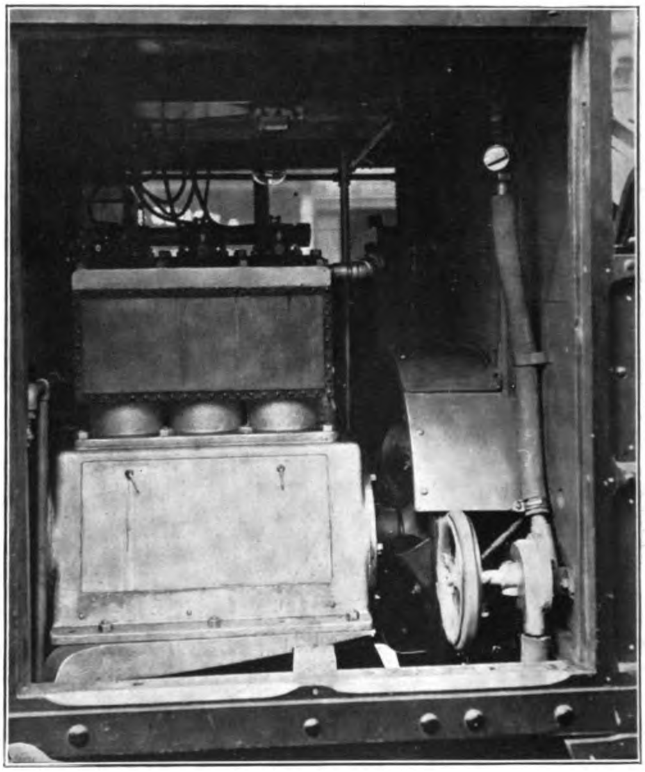
The vehicle is strongly built, and weighs a little over three tons. The front axle is of a built-up girder construction, and closely resembles those on the vehicles previously described. The steering gear does not call for any special comment; the wheel, with a part of the vertical pillar, is seen in the illustration. The tanks are arranged behind the driver's seat, and the seat itself is at a considerable height above the ground. Very effective brakes are fitted, and the control is apparently thoroughly satisfactory.

We recently took a run on this truck, carrying a useful load of one ton, and were thoroughly pleased with its performance. The wheels are shod with solid rubber tyres, which conduce to very smooth riding. It is decidedly speedy for its class, and although somewhat slow on a steep hill, is capable of ascending very severe gradients without difficulty. It took its load from the Embankment up the Savoy Hill to the Strand, and the only difficulty experienced was when re-starting on the steepest part. The driving wheels were inclined to spin round and to fail to grip the road. By using sand, easy starting was assured, and it is only fair to state that the roads were in an exceptionally greasy condition at the time.

From what we have seen of the Fischer vehicles, we believe that their most useful field is for trucks of this size, and for omnibuses. The system naturally involves a certain amount of weight owing to the presence of the dynamo, the electric motors, and the accumulators, and is, therefore, hardly applicable for those automobiles in which high speeds are required, and in which the useful load carried is relatively small. The weight of these parts, however, is comparatively unimportant when moderate loads are carried, and when the speed required is not great. From a commercial point of view, the system should prove very satisfactory for the particular purposes which we have specified, because the accumulators required need not have a large capacity although a high rate of discharge is essential. The type of battery wanted is of the hardy Planté form, made for stationary purposes, rather than of any special traction pattern. In the latter, durability always has to be sacrificed to a certain extent for lightness and they are only necessary when a high capacity is aimed at.

A very much larger truck was also imported by the English Syndicate a short time ago. It recently ran from London to Liverpool *viâ* Derby and Manchester, and succeeded in completing the 219 miles in very bad weather without any breakdown. The truck is intended to carry loads of as much as ten tons, and is geared to speeds up to 4 miles an hour. The average speed maintained on the trip was 2⅛ miles an hour, no attempt being made to run fast. The fuel consumption for the journey worked out at 1⅛ gallons per mile.

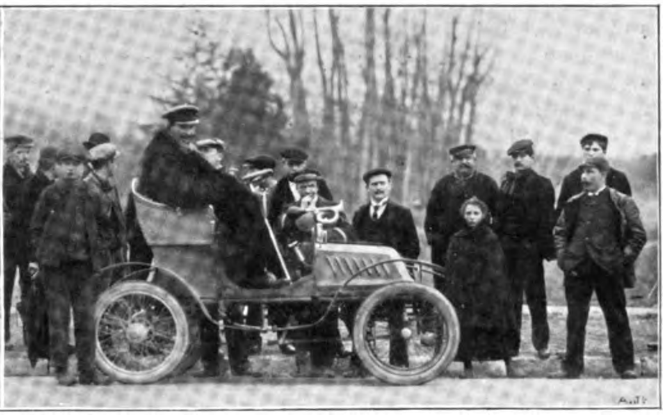
This truck is fitted with a 22-h.p. petrol engine and a 9 kilo-watt dynamo. The battery consists of 48 cells, having a capacity of 150 ampère hours. Two 7½-h.p. electric motors drive the rear wheels. The vehicle is 18 ft. 4 ins. in length over all, and has 7-inch solid rubber tyres. It is at present being tested in actual use in Liverpool, and should afford some very useful data concerning the applicability of the Fischer system to vehicles of this large size. We await further information concerning its performances before expressing any very definite opinion, but we think that the Company will find omnibuses, and trucks for more moderate loads, a more satisfactory field of operation. We have already given several reasons for this view of the case, and we would again draw attention to the fact that for such conveyances as these, starting without shock, attaining full speed quickly, independence of operation and quietness of working are advantages of considerable importance.



The 3-Cylinder Engine in the Fischer 1-ton Truck.

We understand that some of the new omnibuses, which are to be run in London, are expected shortly, and that a 2-ton truck will arrive from America in a day or two.

The 12-h.p. Chenard-Walcker Car, driven by M. Walcker.



The 6-h.p. De Dion-Bouton "Populaire."

THE PARIS FUEL CONSUMPTION TRIALS.

PARIS FUEL CONSUMPTION TRIALS.

THE second Consumption Test of *L'Auto*, which as last year took place between the two first cars in each class in the first trial, was decided last Monday. As already announced, the plan adopted was to give each car a specific quantity of fuel and let them run round the same course as on the first occasion, then continue to circulate round a road in the Bois de Boulogne until they had exhausted the whole of their fuel, the distance so run of course determining the winner in each class. A remarkable performance was accomplished by one of the new 6-h.p. De Dion-Bouton cars, which covered on 5 litres of petrol 146·130 kilometres. The two Chenard-Walcker cars again did marvellously well, and although covering a less distance on 7 litres of petrol, their ton kilometre performance brings them out at the top of the list in the general classing. Twelve cars started, one using alcohol, viz., a 6-h.p. Peugeot (No. 32), and all completed the necessary distance with the exception of three, which broke down through mechanical troubles. These were Class 4, No. 25, (8-h.p. Bardon), and in the Industrial Vehicles No. 1 (6-h.p. Gillet-Forest), and No. 54 (8-h.p. Prunel). The results are given in the accompanying tables, and full particulars of the first trial will be found in our issue of February 28th.

Official No.	Make and H.P.	Gross Weight, kilogs.	Distance Run, kiloms.	Consumption. per ton kiloms. Litres.
	I.—VOITURETTES, 250 *to* 400 *kilogs.*, 5 *litres fuel*			
41	6-h.p. De Dion-Bouton "Populaire"	610	146·130	·0562
42	6-h.p. De Dion-Bouton "Populaire"	590	122·300	·069
	II.—LIGHT CARS, 400 *to* 650 *kilogs.*, 6 *litres fuel.*			
33	6-h.p. Peugeot	960	112·315	·0556
32	6-h.p. Peugeot	900	118·050	·0566
	III.—CARS, 600 *to* 1,000 *kilogs.*, 7 *litres fuel.*			
17	12-h.p. Chenard-Walcker ...	1,200	121·340	·04807
16	12-h.p. Chenard-Walcker ...	1,170	113·180	·0528
	IV.—HEAVY CARS, *over* 1,000 *kilogs.*, 8·400 *litres fuel.*			
19	8-h.p. Mors...	1,180	100	·071

Official No.	Make and H.P.	Weight in kilogs.		Fuel in litres.	Distance Run. kiloms	Consumption per ton kiloms. in litres.	
		Useful load.	Gross weight			Gross.	Useful load.
	V.—INDUSTRIAL VEHICLES *carrying over* 1 *ton.*						
35	8-h.p. Peugeot ...	3,225	4,775	15·125	67·300	·04706	·0696
26	5-h.p. Bardon ...	1,520	2,340	7·660	69·630	·04710	·0723

GENERAL CLASSING.

		Consumption per Ton Kilom. in Litres.	
		Mar. 16th.	Feb. 19th.
1.	12-h.p. Chenard-Walcker (17) ...	·04807	6th, ·0614
2.	,, ,, ,, (16) ...	·0528	4th, ·0542
3.	6-h.p. Peugeot (33)	·0556	3rd, ·0536
4.	6-h.p. De Dion (41)	·0562	14th, ·0733
5.	6-h.p. Peugeot (32)	·0566	7th, ·0635
6.	6-h.p. De Dion (42)	·069	16th, ·0764
7.	8-h.p. Peugeot (Wagon) (35) ...	·0696	1st, ·0489
8.	8-h.p. Mors (19)	·071	10th, ·0713
9.	5-h.p. Bardon (26)...	·0723	2nd, ·0496

IT is officially announced that there will be nine classes in the "Circuit de l'Argonne" being organised by the Chambre Syndicale de l'Automobile for July 19th. Four classes will be governed by weight, and five will be determined by cylinder capacity. They will be divided as follows :—

		kilos.	francs.	
(*a*)	Vehicles weighing under	50 ...	100	entrance fee.
(*b*)	,, ,,	250 to 400 ...	200	,,
(*c*)	,, ,,	400 to 650 ...	300	,,
(*d*)	,, ,,	650 to 1,000...	400	,,

The cylinder capacity classing confined to 4-wheeled 2-seated vehicles will be :—

			francs.	
(*e*)	1·5 litres,	maximum capacity...	200	entrance fee.
(*f*)	1·5 to 2·5 litres	,, ...	200	,,
(*g*)	2·5 to 3·5 ,,	,, ...	300	,,
(*h*)	3·5 to 5 ,,	,, ...	300	,,
(*i*)	5 to 7 ,,	,, ...	300	,,

Entries will be received up to July 11th, double fees being charged after June 15th. Order of starting will be balloted for by all applicants up to April 15th, after which cars will start in the order of entry.

Entries for the Paris-Madrid event now total up to 243, the latest including three more Clement cars, an Eagle Engineering Company's voiturette, and another Wolseley high-powered car.

After much fruitless work, owing to difficulties with the authorities, the Long Island Automobile Club (U.S.A.) have practically determined to abandon their proposal to hold a road race during the spring.

The speed trials to be held by arrangement with the Southport Corporation will probably be organised by the Liverpool Self-Propelled Traffic Association, as the London Club finds it impossible, in view of the Gordon-Bennett Race, to devote the time to its organisation.

The Touraine Automobile Club "circuits" for April 17th and 18th will be, starting from Tours for the first day, over a distance of 148 kilometres, *via* Chateaurenault, Loches, and St. Maure. The second day will be through Chateau La Valliere and Chinon, 135 kilometres.

Americans are reported by Consul-General Gowdy to have spent in Paris last year £160,000 on automobiles, a certain amount of consolation to the American people, however, being forthcoming in the same report from the fact that similar purchases by England greatly exceed these figures.

M. Leon Serpollet, always anxious to meet men of equal metal with himself, seeks to induce the Hon. C. S. Rolls to try his automobiling powers against him on the Nice Promenade des Anglais. April 5th is the date suggested, and Mr. Rolls may possibly be induced to accept M. Serpollet's challenge.

The German Automobile Club are organising for the coming season a run in June from Berlin to Paris, *via* Mecklenburg and Hamburg, to arrive in time for the A.C. de France *fêtes*; a heavy vehicle trial from Frankfort-am-Main to Munich, *via* Nürnberg, and in July a run from Berlin to Frankfort-am-Main, in connection with the automobile races announced to take place in that city.

The prohibition of the big racing event for the Nice Week has reduced the interest of the meeting to such an extent that the entries for the Paris-Nice "Caravan" of *L'Auto* have not been sufficiently numerous to justify its organisation being proceeded with. The Speed Trial on La Turbie Hill has been officially sanctioned, and particulars of the two Tourist event for March 30th and 31st are now available. There are two distinct tours, the one embracing about 300 kilometres each day, and the other an average of about 165 kilometres per day. In both events cars can be entered in a "selling" class, that is the price of the cars so entered is stated beforehand, and the car must be sold to the public after the race at the price so stated. The events are confined to tourist cars, and will be divided into Category A, 2-seated, 2-cylinder cars; Category B, 4-seated, 3-cylinder cars and over. In the Consumption Trial, on April 4th, the cars will receive 100 grammes of fuel per 50 kilos total weight of the vehicle fully equipped, the distance run by each car being the determining factor in the Competition.

Motor Cycle Track Records.—The postponed Fournier-Barden races for £1,000 a side were run off at the Canning Town Track on the 13th instant, and resulted in an easy victory for Maurice Fournier, the Frenchman. The terms of the challenge were for the three best out of five races, but as Fournier won the first three, the full number of races were not run off. About 5,000 spectators were present, and after Fournier had won his match he then, as previously announced, attempted to beat the 10 miles track record. During the run he established two new records, viz., the 6 and 7 miles, his time for the 8th mile being under the record by 2 secs., the machine ultimately going wrong immediately after the 9th mile. Fournier's respective times were:—

£1,000 Match.—1st mile, flying start, 1 min. 14⅗ secs.; 2nd mile, standing start, 1 min. 23⅗ secs.; 3rd mile, flying start, 1 min. 18⅖ secs.

10 Miles.—1 mile, 1 min. 28⅕ secs.; 2 miles, 2 mins. 40⅖ secs.; 3 miles, 3 mins. 55⅕ secs.; 4 miles, 5 mins. 13⅘ secs.; 5 miles, 6 mins. 33⅘ secs.; 6 miles, 7 mins. 52⅗ secs. (record); 7 miles, 9 mins. 12⅘ secs. (record); 8 miles, 10 mins. 36⅖ secs.

On last Saturday F. W. Chase, on the same track, made a successful attempt on the above six and seven miles records of Fournier's. Up to the previous Thursday Chase held all records up to one hour, and he therefore lost no time in regaining his premier position. Chase covered the six miles in 7 mins. 44 secs.; 7 miles in 8 mins. 59⅗ secs., thereby beating Fournier's times by 8⅗ secs. and 13⅕ secs. respectively, and continuing for the 10 miles he made for 8 miles 10 mins. 15⅗ secs., 9 miles 11 mins. 35⅕ secs., and 10 miles 12 mins. 56⅘ secs., thus beating his own previous record time for this distance of 13 mins. 17 secs. The machine ridden by Chase was fitted with a 2¾-h.p. M.M.C. British-made engine, Fournier using a nominal 4-h.p. French engine.

Mr. A. F. Ilsley, for so long associated with Messrs. A. J. Wilson & Co., Ltd., of Clerkenwell Road, has joined Mr. J. Van Hooydonk, who has made such a strong feature of the Phœnix and Trimo machines. Mr. Ilsley, however, is not entirely severing his connection with his old firm. He has arranged to retain his seat on the Board of the Company.

Charmed with the perfect travelling enjoyed on his new Gardner-Serpollet carriage, in journeying to the Riviera, Mr. Alfred Harmsworth has conveyed many expressions of satisfaction to M. Serpollet, particular stress being laid on the remarkable hill-climbing properties of the vehicle. So valuable a testimonial has received due recognition in the Continental automobile Press, and no doubt with the idea of convincing their readers that there has been no mistake in the translation from the English, the French Press have given, side by side with the French translation, some portions of the original English wording. We wonder if Mr. Harmsworth will recognise in the following his original text:—"You may include this quite insolicited testimonial in any advertissement you may be printing."

The automobile is becoming day by day more of a factor in Parliamentary elections. At the Rye election, which took place on Tuesday, most of the old fishermen and farmers positively refused to record their vote at all unless they were conveyed to the polling station in a motor car. Carriages and pairs were at a discount, the cars, on the contrary, careered wildly backwards and forwards, indifferent alike to mud and rain, and collected electors. Full advantage should be taken of the growing popularity of the automobile at the impending Chertsey election, so that a candidate may be secured for the district from whom automobilists will be certain to receive support in the House. Possibly a pro-automobilist Surrey member might help to mitigate some of the persecution which at present exists in that unenviably-managed county.

THE MOTOR PROBLEM, A ROAD PROBLEM.

A Paper Read by W. Rees Jeffreys, Hon. Sec., Roads Improvement Association, at the Automobile Club on March 12th.

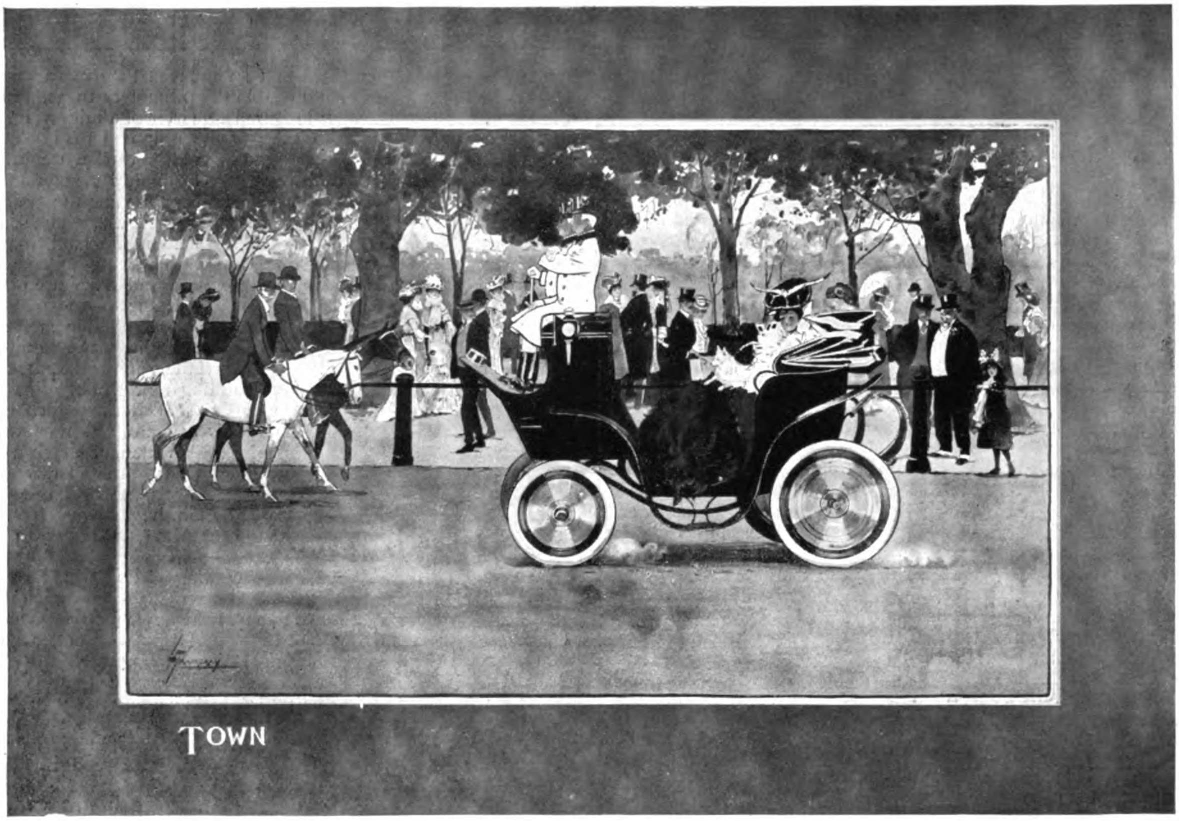
"The motor problem," Mr. Jeffreys said, "had been, during the past year, the topic to which the greatest space had been devoted in the correspondence columns of the daily newspapers, from *The Times* down to the 'local rag,' as the most appetising dish they could set before their readers, the newspaper reporter, in his turn, supplying the demand by drawing upon his imagination, needless to say, in most cases, to the detriment of the automobile. The whole correspondence was an interesting sign of the times, but it did not solve the motor problem. Attempts to make workable regulations for the motor car to be satisfactorily accommodated upon the existing roads had failed. That is, for the motor car to be able to proceed at the average speed of which it was ordinarily capable, viz., 25 miles per hour on the level. The problem to be solved was how to enable this to be done. The development of automobilism would be impeded by anything less, and prevent the country availing itself of the advantages of the mechanically-propelled road vehicle. If this speed was for ever impossible in towns, say, within 15 miles of the Bank of England, and 5 miles of the town halls of Manchester and other large towns, then the motor vehicle was a permanently crippled thing, and was ruled out from playing any large part in the future development of the country. A vehicle was wanted to transport the population from crowded business and industrial centres to residential districts at high speeds. Failing the motor car something must and would be found that could affect this alteration. The future of the motor vehicle therefore depended on the provision of tracks upon which its average normal speed could be maintained. Therefore, the motor problem was first and last a road problem. He was not alone in this view. The Lord Justice Clerk of Scotland said that the question for the future was first, roads; second, roads; and third and last, roads. Mr. Worby Beaumont advocated the expenditure of 125 million pounds on road improvements in this country as sound economy. Colonel Crompton had systematically pointed out the need for adapting the roads for motor traffic, and safeguarding them against the encroachments of the tramcar companies. Mr. Stanley and Mr. Scott Montagu had continually pressed upon the Government the importance of this matter from a national point of view, and before the Automobile Club was born John Ruskin had said that "All social progress resolves itself into the making of new roads."

Dealing with the practical side Mr. Jeffreys divided the problem into three parts: (1) How to construct new roads suitable for rapid traffic; (2) how to improve and widen the roads that already existed; and (3) how to regulate the traffic on both the new and the improved roads.

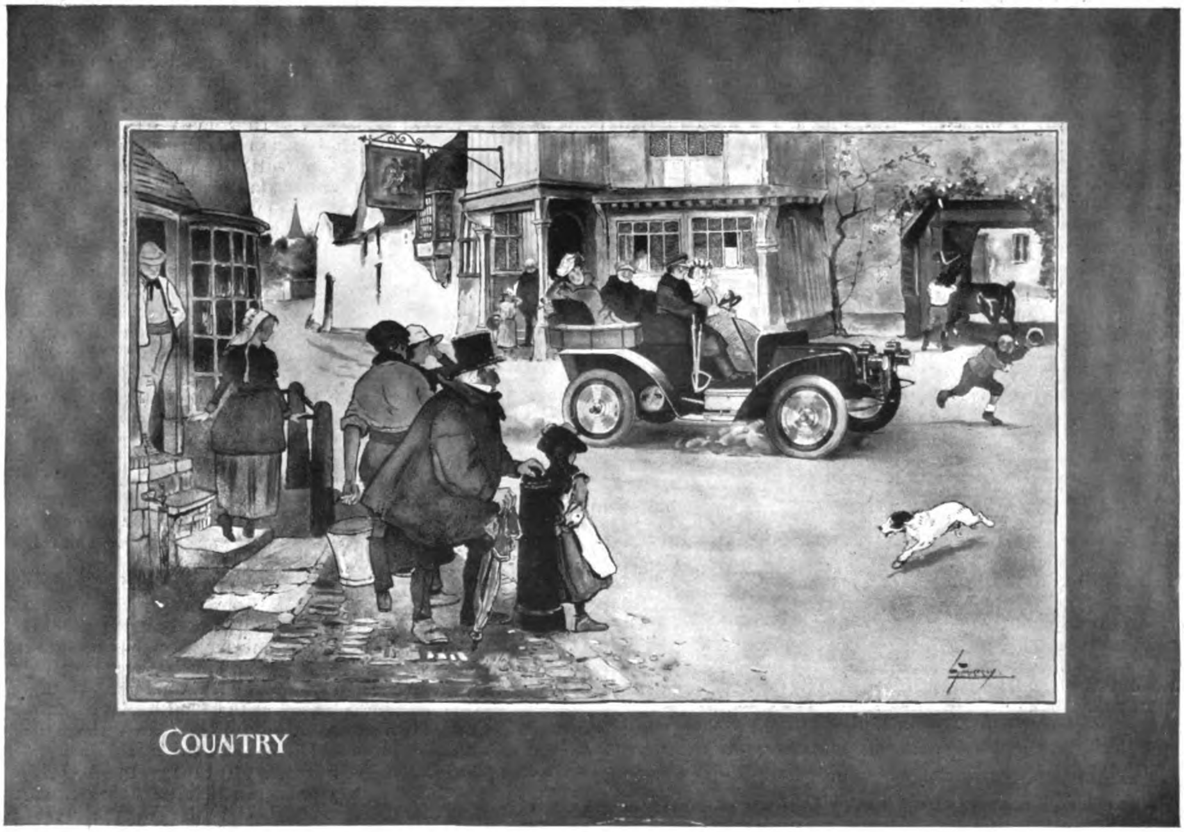
To the first he attached the greatest importance. But here the enormous magnitude of the financial problems had to be taken into consideration. By the instructions of the French Emperor, Baron Haussman entirely changed the aspect of Paris at the cost of 35 millions sterling. Although at the time the Parisians stopped further expenditure, to-day it was admitted that no better investment of public funds had ever been made. As a result, while London was a most squalid and ill-designed city, due to the happy-go-lucky policy of muddle, Paris was a monument of forethought and wisdom. The misfortune of London was that it had never had a unified Government. The jealousy between the innumerable authorities had prevented or delayed the carrying into effect of schemes for the general good of the Metropolis. These difficulties would have to be overcome in securing the building of new trunk roads. He considered that if these schemes were to be realised it must be largely by means of private enterprise and private capital. As there was very little hope that either the State of the local authorities would find much money for building new roads, he advocated what practically amounted to a reversion to the old turnpike system. Road building would have to be made a profitable enterprise, about which there should be no difficulty. Large tracts of land possessing little more than agricultural value existed in the vicinity of all large cities, and it should be possible to acquire these compulsorily with Parliamentary sanction and build new roads, the adjoining land at once obtaining a greatly increased value, the prime outlay thereby being very largely recouped and ultimately showing considerable profit. Companies undertaking these schemes would become land development and transport companies, and build houses and tramways as well as roads. Once demonstrate that these schemes were profitable and there would be no lack of private capital and capitalists to undertake the work for every large town in the United Kingdom as an investment. The A.C.G.B.I. should plan out a scheme to be laid before the Royal Commission on London Locomotion and undertake to form a company to raise the money to build a specimen road out of London, provided Parliament could be induced to give the necessary powers. Those powers should enable the promoters to acquire a strip of land 15, 20, or more miles long and a quarter of a mile wide, that is, one-eighth of a mile on both sides of the proposed road. The promoters should be permitted to build in addition to a track for the horse-drawn traffic, (*a*) a tramway track for both passenger and goods traffic, and (*b*) a motor road, the two latter remaining the property of the company, who would charge a toll for their use. The sources of revenue would be from the ground rents upon the land fronting the road, the profits from the tramway track (this being of considerable value, as throughout the night market garden and dairy produce could be carried), and from tolls from the fast traffic on the motor road. Supply of electric current would provide a further income, and the State and the London County Council should both make a grant in aid of the prime cost of building. As an instance of the improvement in value of property as the result of building new through roads, Mr. Jeffreys mentioned that land in the outskirts of Berlin which could be bought sixty years ago for £1 per Prussian acre, was now valued at £1,500 per acre. The cost of certain roads which, although necessary for proper development of a city, could not be made remunerative, should fall as a common charge upon the city. The most important and profitable suggested new road out of London, he thought, was the one connecting Hammersmith with Slough, enabling traffic to avoid Brentford and Hounslow.

A third class were the roads encircling cities, which should be undertaken out of the public cost. Two roads should encircle every large town, one with a radius of two and the other with a radius of four or five miles from its centre. In France this was done, and Mr. Jeffreys exhibited a map showing the two encircling roads round Paris, and he maintained this was the means whereby the congestion of traffic in the City of London could be relieved. The ratepayers of London, instead of spending huge sums of money for the purpose of widening the city streets, could spend the money to better advantage in building an encircling road on to which the through traffic could be diverted. Speaking of the defects of the present system of highway administration, the speaker exemplified the Great North Road, on which delightful short strips were met with, followed with startling abruptness by other strips of road, the condition of which drove people wild with desperation. No less than 72 highway authorities shared in its administration, of which 46 were actually engaged in its maintenance. Such a method of managing the permanent way of the large railways would lead to consequences too terrible to contemplate. Unity of administration with railways had been secured, and the burden of the charge of rural lines touched by through traffic equalised by making them a general charge upon the revenue of the railway. Until the same principle was applied to highway administration, good roads could not be obtained in England. They must be maintained in accordance with the general needs of the country, and not with the needs of the traffic of a particular district. County Councils should take over the maintenance, and the State should contribute one-half the cost, payments only to be made upon the road being kept in accordance with certain national standards of efficiency. No new buildings should be allowed to be erected on any main roads within 60 feet of the middle of the highway, thus permitting of the road being gradually widened to 120 feet without burdening the public exchequer with the cost of acquiring buildings for the purpose. In towns like Doncaster the circumstances were such that a loop road round the town would be the most advisable. To enable these ideas to be carried out a national authority to apply pressure would be an absolute necessity. Coming to the tramway question, Mr. Jeffreys said the motor car and the tramcar could not exist on the present narrow roads. One must run the other off the road on to a special track of its own. The tramways keeping the centre of the road existed mainly for local traffic, and the sides of the roads being also occupied by local traffic, no room was left for the through traffic. If the victory rested with the tramcar, then ten years hence the main roads would possibly have four sets of rails, the centre rails being for fast cars stopping once every two miles, and the outer rails for cars stopping whenever required.

The remaining question of the regulation of traffic, Mr. Jeffreys said, was the simplest of the three problems. Some progress has already been made by improperly constructed hooded vans being prohibited from 1904 on, and by the necessary preliminary steps having been taken to secure the adoption of a bye-law prohibiting heavy slow-going vehicles from keeping the centre of the roads. A number of other minor suggestions were put forward, such as the banishment of crawling cabs from main roads, the removal of obstructions from the centre of the streets, such as lamp posts and cab ranks, the establishment of bicycle policemen, &c. By way of conclusion he thought the A.C.G.B.I. were the only body to force these changes, and he hoped from the past history of the Club that they would rise to the needs of the occasion.



"Town," by Lance Thackeray. Reproduced by permission of Messrs. Hills and Co., Ltd.



"Country," by Lance Thackeray. Reproduced by permission of Messrs. Hills and Co., Ltd.

The much discussed question whether motor cyclists, as such, should be admitted to membership of the C.T.C., is to be decided by means of a postal vote of the whole of the membership.

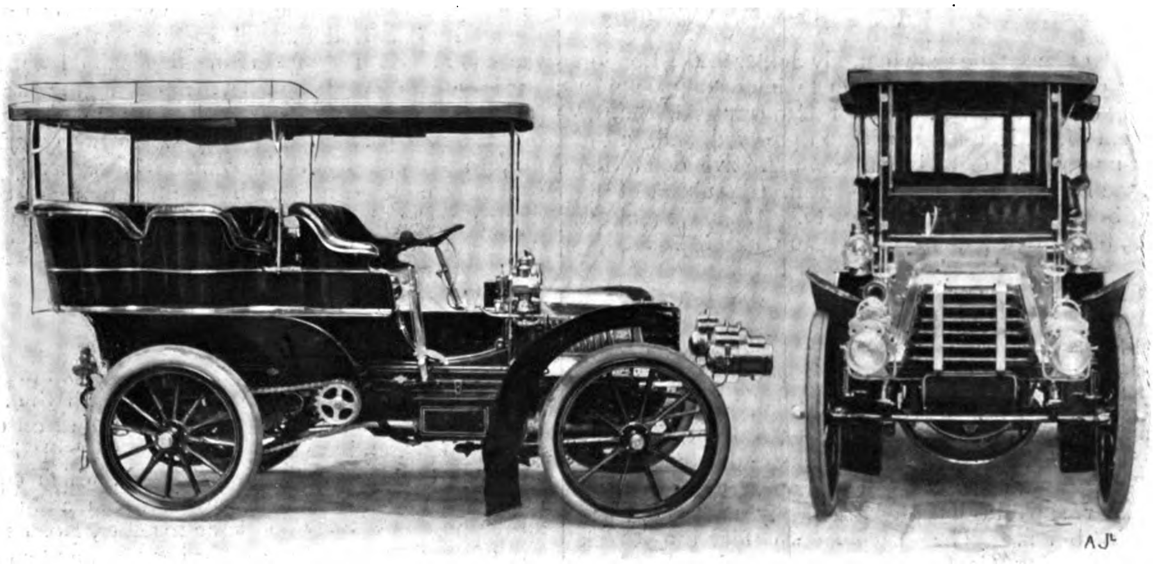
Mr. A. R. Gaudron, on Friday, selected "Twenty-four Years of Ballooning" as the subject for a lecture given before the Aeronautical Institute and Club. Dr. F. Alex. Barton presided.

Emerald green is the colour which has been officially agreed upon for the British cars taking part in the Gordon-Bennett Race this year. French cars will be blue, German white, and American red. We are just wondering how many claimants there will be for having made the first suggestion that the British cars should adopt the Irish national colours.

Mr. Galloway, M.P., of Parliamentary hat-lifting fame, has been converted. He has purchased a 14-h.p. Daimler car.

With a view to economy both in time and money the Wiltshire Finance Committee have recommended the purchase of a County motor car, and the engagement of a chauffeur, for the use of the Surveyor, Officer of Health, and other County officers.

In the House of Lords on Tuesday night the Gordon-Bennett Race enabling Bill was, upon the introduction by Lord Londonderry, supported very strongly by Lord Spencer from the Liberal side, read a second time and passed unanimously. The Bill is also backed by the Marquis of Ormonde and the Duke of Abercorn.



Mr. W. S. Gilbert's New Napier Car.

Mr. W. Schwenk Gilbert, whose fame as an author is world-wide, has just had delivered to him one of the latest ypes of Napier cars which, in the matter of fittings, is one of the most perfectly appointed petrol motor vehicles we have yet seen. In Mr. Gilbert's dramatic works, his originality and departure from the beaten track has always been very marked. In no less a degree are some of the arrangements, which have been introduced into this luxurious car, unique. One particularly ingenious contrivance is the glass screen which can be used either in front or behind the driver at will, the change being effected in the space of a few seconds. This screen, which slides round in two grooved aluminium guides, can, when not in use either behind or in front of the driver, remain completely both out of sight and the way at the top of the canopy. Each seat is practically a miniature arm-chair, and besides storm blinds all round the sides fixed on the canopy, glass dust screens are provided at the back, the two side sections being curved to the shape of the two back tonneau seats. The photographs which we reproduce of the car on this page give some idea of the general appearance of this splendid vehicle.

The first annual general meeting of the Aero Club is announced to be held on the 27th inst. at the Carlton Hotel. Mr. Roger W. Wallace will be in the chair, and an informal dinner will follow the meeting.

Herr Hans Schnapp is credited with having invented a hydraulic pneumatic tyre, whereby all present tyre troubles are to be eliminated. A similar invention has been heard of before, and we fancy that pneumatic tyre manufacturers will await developments with more curiosity than anxiety.

The two photographs of the charming pictures in colours, "Town" and "Country," by Mr. Lance Thackeray, we are able to reproduce by the courtesy of Messrs. Hills & Co., Limited, of 2, Bayer Street, Golden Lane, E.C., by whom they are published. The pictures—which are excellent examples of bold colouring—measure 36 inches by 25 inches. Prints and Artist's Proofs (limited to 100 copies) are obtainable from the publishers.

A decision has now been come to by the Automobile Club as to the division of the secretarial duties when Mr. Johnson's resignation takes effect. Mr. Julian Orde will be the general Club secretary, Mr. W. Rees Jeffreys legislative secretary and editor of the Club journal, Mr. Basil Joy, as technical secretary, taking over the organisation and management of the Club's official trials and the Club garage.

The great walk to Brighton last week was a remarkable performance. The fifty-two miles were covered at an average pace of something like six miles an hour. Somebody had chartered a four-wheeler to try and keep up with the pedestrians, but the horse was soon done up, and this method of seeing the competition had to be abandoned. A motor car was more successful, and the owner succeeded in keeping up with the pedestrians without difficulty. It is interesting to bear in mind that this is about the pace which some of the County Councils would like to establish as the speed limit for cars.

On Wednesday, at the sixth monthly dinner of the London Chamber of Commerce, an extremely interesting subject was up for discussion, viz., "Motor Cars and Air Ships." Sir Vincent H. B. Kennett Barrington presided, and, in the usual manner of the Chamber, a representative organising Committee had been appointed to ensure the subject of the evening being adequately dealt with. This Committee included, besides Mr. Charles Charleton as chairman, the Hon. C. S. Rolls, Messrs. H. Austin, Paris Singer, S. F. Edge, C. Jarrott, Sidney Straker, T. F. Woodfine, Dr. F. A. Barton, Col. Sir John Roper Parkington, J.P., Mr. W. H. Chaplin, Mr. W. Hill, and Dr. W. H. Hutchinson.

Last week we published official plans showing the positions of the various exhibitors at Messrs. Cordingley and Co.'s Automobile Show, which opens to-day (Saturday), at the Agricultural Hall. There appear to have been a few minor slips in its preparation by the organisers of the Exhibition. The space shown for the Creek Street Engineering Company should read the Cremorne Motor Manufacturing Company (of Chelsea), this being the new name of the Company since November 1st last. In the case of the space shown as occupied by the General Motor Garage, this should read Great Central Garage, Limited. We are requested to point these little discrepancies out so that visitors using the plan may be able to readily find the stands of the two firms in question.

Last week Mr. John Adam, as chairman, presided at the annual general meeting of the Scottish Automobile Club (Western Section). The Lord Provost of Glasgow was re-elected Honorary President, and the new Committee for the ensuing year was constituted as follows:—Messrs. John Adam (chairman), Jas. Burns, J. B. Talbot Crosbie, Wm. H. Kingsbury, T. Blackwood Murray, Pat. Drummond, D. McColl, H. M. Napier, Jas. R. Nisbet, John M. Ross, Robert J. Smith (secretary), H. Prosser, T. Syminton, Wm. Weir. Messrs. J. R. Nisbet and T. Syminton were nominated as representatives to the General Council of the A. C. G. B. I., and Messrs. J. R. Nisbet and R. J. Smith were appointed to the Council of the Motor Union. The membership of the section at the date of the meeting was announced to be 127.

On Monday last the first ballot took place for selection of position at the Society of Motor Manufacturers and Traders 1904 Automobile Show at the Crystal Palace. Mr. Frederick R. Simms presided. There were 72 applications for over 52,000 square feet of space. Arrangements have been made to largely increase the amount of available space for the next show. The meeting was not unanimous in its views as to the manner in which the ballot was to be conducted, and before the course ultimately decided upon was carried out, a considerable amount of argument and confusion arose. The situation was not helped by the discovery that several of the applications were dated subsequent to the day officially announced as the last day for receiving applications for the first ballot, viz., March 6th. In some cases this was no doubt due to second applications being sent in, in consequence of the date of the show being altered. In the meantime, conforming to the conditions of application, those had to be ruled out of the first selection, it being subsequently, however, by resolution of the meeting, agreed that all applications received prior to the commencement of that meeting should be entitled to participate in the ballot. At times, in the heat of the argument, the Chairman's end of the room was almost uncomfortably crowded by members who had pressed forward to emphasise their points. Subsequently the room gradually emptied as one by one the numbers were drawn and spaces had been selected on the official plan. Murmurs of discontent at the arrangements for the ballot prevailed, however, until the close of the meeting.

Referring to this meeting, the Duryea Company write us suggesting that for the future, so as to avoid the unseemly wrangling which arose in connection with the method of balloting, that a leaf might be taken out of the cycle makers' book, and the system adopted in balloting for the space at the National Show adopted, which consists in marking out the available spaces on a plan, and drawing for all the positions, small and large together, No. 1 taking the end of the first line, No. 2 following next, and so on to the end. If applications exceed the available space all are cut down proportionately, and to avoid small exhibitors being sandwiched between large ones a number of small exhibits are combined into group blocks, and the position of that block balloted for.

LAW REPORTS.

Hire Purchase Agreement: Granting Time Constitutes a Waiver.—An important decision affecting hire purchase agreements was given by Judge Edge at the Clerkenwell County Court last week in an action by an engineer against Messrs. Wood, Cole and Co., Limited, of Camden Town, for damages in trespass in taking back certain goods supplied on the hire purchase system. The plaintiff signed an agreement for £25 16*s.* and paid £23 2*s.* thereunder. Being in arrears the defendants seized the goods, although the balance was tendered at the time. The jury decided that, extended time having been granted, a waiver of the agreement had been constituted, and gave a verdict for the plaintiff with £25 damages. The Judge confirmed the finding of the jury and gave judgment, as he said there could not be two time limits, and if the defendants chose to extend the proper agreement limit they could not, just when they got tired of waiting, refer back to the agreement. By waiving the limit and taking irregular payments the defendants had practically destroyed all right to demand payment except of the balance and not on the terms of the agreement, which was forfeiture of the goods. Execution was stayed to allow of an appeal.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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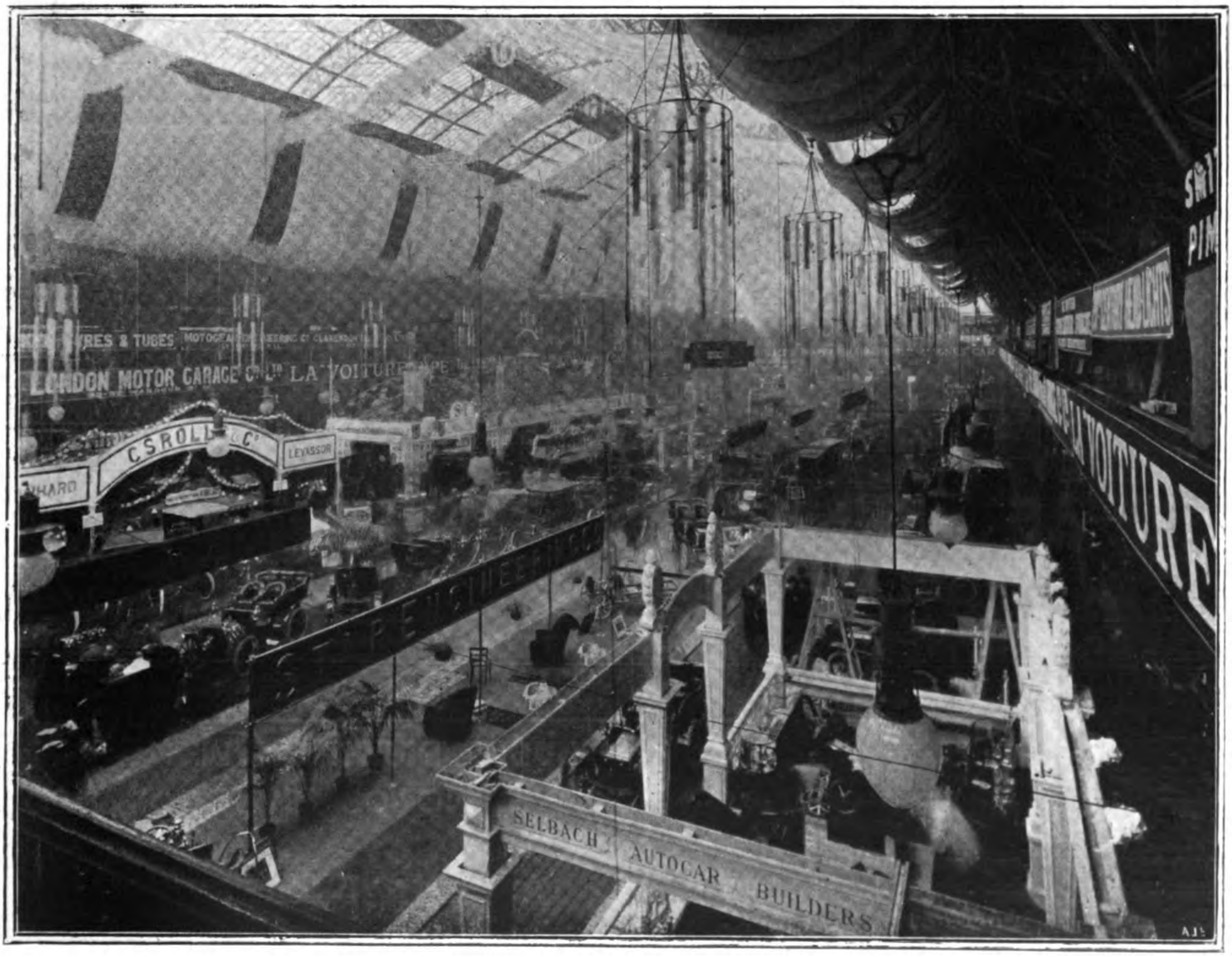

[Photograph by Argent Archer, Kensington.

GENERAL VIEW OF MESSRS. CORDINGLEY AND CO.'S MOTOR EXHIBITION AT THE AGRICULTURAL HALL.

CARS AND SYSTEMS.

FULL illustrated descriptions of the majority of the leading motor vehicles and systems have appeared in THE AUTOMOTOR JOURNAL during the past year. These enable the mechanism and functions of the various parts pertaining to each separate system to be clearly understood. The cars and systems described include the following :—

	No.		
Brooke ...	67	April	19
	115	Mar.	21
Brush ...	68	April	26
	82	Aug.	2
Simms Motor War Car	67	April	19
Benz-Parsifal	68	,,	26
	106	Jan.	17
Bardon	69	May	3
Deschamp ...	70	,,	10
Gillet-Forest ...	70	,,	10
Roots and Venables	70	,,	10
Wolseley	71	,,	17
	73	,,	31
	74	June	7
Napier ...	71	May	17
	101	Dec.	13
	107	Jan.	24
Blake	72	May	24
Humber...	75	June	14
	76	,,	21
	82	Aug.	2
	108	Jan.	31
Fischer ...	75	June	14
	87	Sept.	6
	115	Mar.	21
Meredith ...	75	June	14
Rex	77	,,	28
Gardner-Serpollet	77	,,	28
	78	July	5
	79	,,	12
	80	,,	19
Oldsmobile	80	,,	19
	86	Aug.	30
Daimler...	81	July	26
	82	Aug.	2
Ivel	81	July	26
Renault... ..	81	,,	26
Gladiator	82	Aug.	2
	104	Jan.	3
Protos	83	Aug.	9
Weston... ...	83	,,	9
Chatel-Jeannin	84	,,	16
Brightmore ...	85	,,	23
Lister	85	,,	23
Prescott ...	85	,,	23
Pioneer	86	,,	30
Ariel ...	89	Sept.	20
	90	,,	27
	91	Oct.	4
Wilson and Pilcher	90	Sept.	27
	108	Jan.	31
Motor Mfg. Co. ..	92	Oct.	11
Princess... ...	92	,,	11
Swift	93	,,	18

	No.		
Milnes-Daimler	94	Oct.	25
	95	Nov.	1
	113	Mar.	7
White Steamer	95	Nov.	1
	96	,,	8
	106	Jan.	17
Clarkson and Capel's "Chelmsford"	96	Nov.	8
	97	,,	15
	98	,,	22
Alsop	97	,,	15
Alldays and Onions' "Traveller"	98	,,	22
	99	,,	29
Toledo (Petrol)...	98	,,	22
,, (Steam)...	107	Jan.	24
Peerless ...	98	Nov.	22
Pedrail	98	,,	22
Watsonia-Durkopp	99	,,	29
	100	Dec.	6
	101	,,	13
Pipe	102	,,	20
Wartburg ...	104	Jan.	3
Darracq	104	,,	3
De Dietrich ...	104	,,	3
Charron, G. V....	104	,,	3
Ader	104	,,	3
Huber	105	,,	10
Delahaye ...	105	,,	10
Krebs Carburettor	105	..	10
Velox ...	105	,,	10
	106	,,	17
De Dion	106	,,	17
Mercedes	107	,,	24
	114	Mar.	14
	115	,,	21
Becket	108	Jan.	31
Waddington ...	108	,,	31
Chenard and Walcker	108	,,	31
	109	Feb.	7
City & Suburban Petrol-Electric Car	109	,,	7
Thornycroft Petrol Car	110	,,	14
Earl	111	,,	21
Germain (Electric change-speed).	111	,,	21
Locomobile (1903)	112	,,	28
Cottereau ...	113	Mar.	7
Simplex Speed Gear	113	,,	7
Maudslay (1903)	114	,,	14
Miesse (Steam)	115	,,	21
"Sunbeam" (Marston's)	115	,,	21

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N.B.—For descriptions of other cars and systems, *see* General Index to Vol. VII.

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CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.	
*April 24... ...	Quarterly 100 Miles Trial.
April 25... ...	Eliminating Trial Gordon-Bennett Race.
April 27, May 4, 11, 18	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14 ...	Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
*June 13	Gymkhana at Ranelagh.
*July 1st to 15th	Gordon-Bennett Cup Race. Speed Trial at Dublin. Start for International Tour through Ireland. Motor Boats Race, Queenstown Harbour (Alfred Harmsworth Challenge Cup). International Hill Climbing Trial at Belfast (Henry Edmunds Trophy).
July 24-25 ...	Southport Speed Trials.
*August	Tourist Motor Bicycle Reliability Trial.
*September ...	The 1,000 Miles Trial.
1904.	
...	*Light Van Trials.
*Feb. 12-24 ...	Crystal Palace Exhibition.

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
March 17–28 ...	"Criterium des Transports Automobiles." 1,072 kiloms. (*La France Automobile*). Classes A, B, E.
March 22–28 ..	Ditto. Classes C, D, F, G, 1,014 kiloms.
March 28–April 5	Nice Automobile Week.
April 16–20 ...	A. C. de Touraine Tourist and other Trials.
May	Speed kilom.—Geneva (Swiss A. C.).
May 14	Paris-Madrid. Start of Tourist Section.
May 16–24 ...	Stockholm Exhibition.
May 24, 25, 26 ...	Paris–Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June ...	Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18–23 ...	Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 25–July 1 ...	Aix-les-Bains Auto Week (Auto Club du Rhone).
July	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
July 5	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August	Circuit des Ardennes.
August 16 ...	Race Trelex-Saint-Cergves (Swiss A. C.).
September ...	Udine Exhibition (Italy).
Oct. 15–21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

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PASSING EVENTS.

THE EXHIBITION.

In describing the present Exhibition at the Agricultural Hall, as when dealing with the Crystal Palace Show, we refrained, as our readers will have noticed, from giving detailed descriptions of each individual exhibit, which was at one time the recognised method of dealing with such events. The Paris Exhibition was the first of the set at which the new models for 1903 were put before the public, and in describing that display we recorded our general impressions of the improvements in automobilism, to which it bore witness, and gave detailed descriptions of the leading new types there introduced. In dealing with the subsequent Exhibitions we have refrained on principle from detailed description of anything but the most novel and interesting exhibits, and many of these we have preferred to treat in separate and independent articles. We have found ourselves compelled to adopt this line owing to the great multiplicity of very similar constructions, which would necessitate a great deal of vain repetition and the consumption of an enormous amount of space. We believe that the line we have adopted supplies our readers with the kind of information which they most generally desire, and we have good reason to believe that it is only the exhibitors themselves who wade through much that appears concerning these shows. There may be people who revel in "reports of every machine exhibited"; but we think these people are exceptional in more ways than one, and are by no means numerous. The Crystal Palace Exhibition gave us an opportunity of pointing out where the most recent English practice resembled or differed from that of the Continent, and we week by week deal with new machines and accessories in a much more thorough manner than is possible in a show report. In this issue, for instance, we give special articles on the Soames, the Miesse, and the Chaboche cars, all of which are drawing the attention of visitors at Islington, and about which information is in demand. The practice in evidence at the Agricultural Hall differs only in detail from that shown at the Crystal Palace; and to those detailed differences we are devoting our attention, either in our report which commences this week, or in separate illustrated articles.

NUMBERING THREATENED.

Dealing a short while ago with the debates at the Automobile Club, and the legislative proposals for amending the law in relation to motor vehicles, we pointed out the danger that menaces the movement if automobilists generally, and the majority of the Automobile Club in particular, maintain the *non possumus* attitude which those who voted for the motion against the adoption of means of identification appeared desirous of taking up. The danger, of course, is that we shall get the numbering without the speed limit being removed. The danger is coming nearer. Last week Sir Howard Vincent asked the President of the Local Government Board whether he would consider the advisability of affording pedestrians and owners of horses and carriages injured by motor cars the means furnished by European countries of identifying their drivers by a conspicuous number on the motor car. The form of this question is highly edifying. It, of course, does not actually say, but it very strongly suggests, that our roads are strewn with the *débris* of horse-drawn carriages and the fragments of foot passengers which have been left in the reckless path of the uncontrolled and uncontrollable "modern Juggernaut" (that we believe is the consecrated phrase). Quite as many automobiles are injured by horse-drawn vehicles, in fact, we believe more than they themselves injure, so it would only be fair to provide similar means of identification for the latter. We are glad, however, to see that Sir Howard Vincent did not get much satisfaction out of the Government. Mr. Long evidently does not intend to saddle motor cars with numbers under his existing powers, as the answer given was that legislation would be necessary. But the putting of this and similar questions, as for instance, to the Home Secretary by Dr. Farquharson subsequently, emphasise the existence of the danger. If questions of this kind continue to be asked by influential members, legislation is practically certain to be introduced, and if it takes the form of the introduction of numbers or names *without* the abolition of the speed limit, automobilists will only have themselves to thank.

◆

Almost immediately afterwards Lord Mayo distinguished himself on an allied subject in the Lords. The noble Earl wanted to know, in view of the increasing number of small steam boilers in use in motors, motor omnibuses, steam lurries, &c., what system of inspection was adopted with regard to these boilers. It seems difficult for the opponents of the automobile movement to speak of it without exaggeration, so his Lordship added a horrible story about an explosion occurring to the boiler of a motor in the country which was so effective that the man who was driving it was blown up and never seen again. Perhaps this was the original of Mr. Wells' Plattner, who was blown into the "fourth dimension." But he came back ultimately. We should like to know where Lord Mayo's explosion took place.

AN OCCASION FOR PROTEST.

THE significance of the change which has come over both the character and style of the Club *Journal* since it ceased to be *Notes and Notices*, and became the *Automobile Club Journal*, is well illustrated by two notable letters which have been addressed to it, and published in its issue of last week. The first is as follows:—

> "I am much obliged for your favour of the 10th instant. As a member of the Motor Section of the Automobile Club, I believe that it is desirous that we should have reports of every machine exhibited. I prefer to have my information through my Club *Journal* rather than through outside papers, the writers in which may to some extent be biassed."

In the second, the writer, after explaining his satisfaction that his motor bicycle was, after all, mentioned in the Club *Journal*, concludes as follows:—

> "I feel very strongly on the question of the *Journal*, because it is at once official, and the information it contains is written by experts in whom the Club Committee have every confidence, and who, in my opinion, should be remunerated in such a way as to make them quite independent of any outside interference. Outside journals, no doubt, serve a very good purpose, but cannot be so independent as a paper run on lines of the *Automobile Club Journal*."

Both these letters are highly remarkable and suggestive. Their tone is extraordinary, and even more extraordinary — their tone being such as it is—is the fact that they should have been addressed to a body of the influence and position of the Automobile Club through its official journal. It is not less surprising that they should have been published, for what is it that the writers suggest? They make the innuendo that other automobile journals cannot be as independent as the *Automobile Club Journal* (and, in fact, are not so independent), and that the writers in them may be, and are, to some extent biassed. Why should they be? This is not a matter for mincing words. If the accusation has any meaning whatever, it means that the automobile Press of this country is not an honest Press, that it is subservient to its advertisers, and apportions praise or blame to exhibits and new introductions, not according to their deserts, but according to whether the exhibitors are good customers. Not only this, but the Club *Journal*, in affording the hospitality of its columns to the letters and *withholding the writers' names*, is endorsing their views. We protest against the letters, both on our own behalf and on behalf of the automobile Press generally of this country. The insinuations they contain are an insult and a libel as well. We should have resented these letters even if the Club *Journal* had maintained the original correct attitude which it bore long and honourably as *Notes and Notices*. But ever since it has attempted to obtain the pecuniary support of the trade by not merely accepting advertisements, but actually employing its staff to canvass for them, it has become a *trade journal* pure and simple. As such, the publication by it of these suggestions comes with a peculiarly bad grace.

In fact, it is quite possible for the Club *Journal* to be less independent than the "outside" Press. It is conducted by removable officials supervised (by no means efficiently) by a Club committee, and these officials have no permanent interest in the undertaking. The danger inherent is the situation is indeed dimly recognised in one of the letters, as the writer suggests the officials should "be remunerated in such a way as to make them quite independent of any outside interference." But, however highly a "removable" may be paid, he can never have the same interest in being above reproach as a man who is conducting his own journal. To injure its reputation for impartiality is to depreciate his own property, and "enlightened self-interest" conspires with honour to reprobate such a course.

Considering the implied reflection on the staff which at present conducts the Club *Journal*, it is a mystery to us how these letters came to be inserted It almost seems that in anxiety to aim a reflection at the *bonâ-fides* of the "outside" automobile Press, that staff has been "hoist with its own petard." It is a petard that is exploding.

The policy adopted is bringing the Club as a body, and as individuals, into an unsatisfactory and not very dignified position. It would have been perfectly easy to secure the support of the trade for the Club in a variety of ways that would not have involved such a situation. The Club has done invaluable work for the trade. The trade fully recognises its indebtedness, and is not only ready but anxious to support the Club in return. But neither the influence of the Club with the public or the trade, or the good will of the latter towards it, are likely to be increased by the particular method that has been adopted of sending round the hat, and rather ostentatiously forcing the trade to see that there is a hat being held out.

REFORMING THE INNKEEPER.

THERE has always been an impression prevalent amongst innkeepers that the refreshments which it is their duty by law to supply on demand should on principle include the cup that cheers and also, if unduly indulged in, inebriates. They view with coldness, oftentimes mingled with disdain, the temperance customer who orders lunch, dinner, or some other refection accompanied only by ginger-beer, lemonade, or tea. It is a mystery why this is so, for the charges usually made by innkeepers for the eatables even without the drinkables are almost always on a sufficiently elaborate scale to ensure an adequate margin of profit to the purveyor. By law, however, an innkeeper's duty is to provide you with whatever refreshment you desire, and you have a legal right to extract from him bread and cheese dry, or accompanied only by a cup of cold water—if you can. This has always been the law, but it has been very difficult to enforce it. Temperance automobilists—and there are a good many of them—will, therefore, be glad to learn that there is satisfactory prospect of introducing legislation on the subject at an early date. The Innkeepers' Liability Bill has been read a second time by a majority of 120 to 16. This Bill does not in any way alter the existing law. It merely provides satisfactory and expeditious means of enforcing it. Formerly you could only take action against an innkeeper for damages if he refused to supply what you wanted, and you very seldom, if ever, got any. When the new Bill is passed into law, the recalcitrant innkeeper can be haled before the magistrates, and, on summary conviction, adequately fined. This will go a long way to reforming a good many of our smaller inns, which are at present practically nothing but drinking shops, and will consequently benefit automobilists, whether temperance advocates or not.

PETROL IN INDIA.

WE have referred on several occasions to the high price of petrol in India, owing partly to the action of the Indian Railways, and partly to the attitude maintained by the Indian Government. A Committee of the Automobile Club has been for some time agreed in endeavouring to procure a diminution of the restrictions imposed on its transport. The Assam Oil Company also have been active, and we understand that the Calcutta Port Commissioners have permitted the establishment of a depôt at Moyapur, just outside the city. The Assam Oil Company, Limited, accordingly write to us that as the result of these concessions they are now in a position to supply petrol in Calcutta in practically unlimited quantities and at a very moderate price. The difficulties to which we have previously had occasion to refer as hitherto standing in the way of adequate development of the motor car industry in a country such as India, where it is calculated to be so particularly serviceable, may thus, as far as Calcutta is concerned, be regarded as removed. A commencement having been made in Calcutta, other important centres will no doubt also follow the same lead, to the great advantage of the industry in India. At the same time we hold to the opinion we previously expressed that the most suitable oil for India is one of somewhat higher gravity than the petrol used in this country, and that that is the kind of fuel that ought to be imported and pushed.

TO SUPPLY A WANT.

THE South-Eastern Railway has for many decades been the butt of the first witticisms of the budding humorist. Innumerable are the ancient and time-honoured legends illustrative of the negation of speed to which the rolling stock of that Company attains, particularly on its suburban branches. Some few years ago the Board of Trade enquiry into the Lewisham collision revealed that it was, in the opinion of the railway officials, due to two trains having arrived at the junction true to advertised time on the first occasion since the construction of the line. Since its amalgamation with the Chatham and Dover, that never very expeditious line has taken to emulating its sister Company with a very high degree of success. Automobilists had an opportunity of experiencing the delights of travel by this line during the last Crystal Palace Show. It was a gruesome ordeal, but it is bearing good fruit, and there seems to be some prospect of a really influential movement being set on foot in the neighbourhood of the Crystal Palace for a service of motor 'buses to run between that suburb and town. The project ought, if carried out, to be highly successful. There is a large business population going to and from town every day, which at present has either to join in the funeral *cortège* organised and conducted by the Chatham Railway, or to walk a long way down the hill and take the train on the London and Brighton, a line which though slightly speedier than the other, seldom attains to any very break-neck pace. We trust the proposal will take tangible shape at an early date.

THE GORDON-BENNETT RACE.

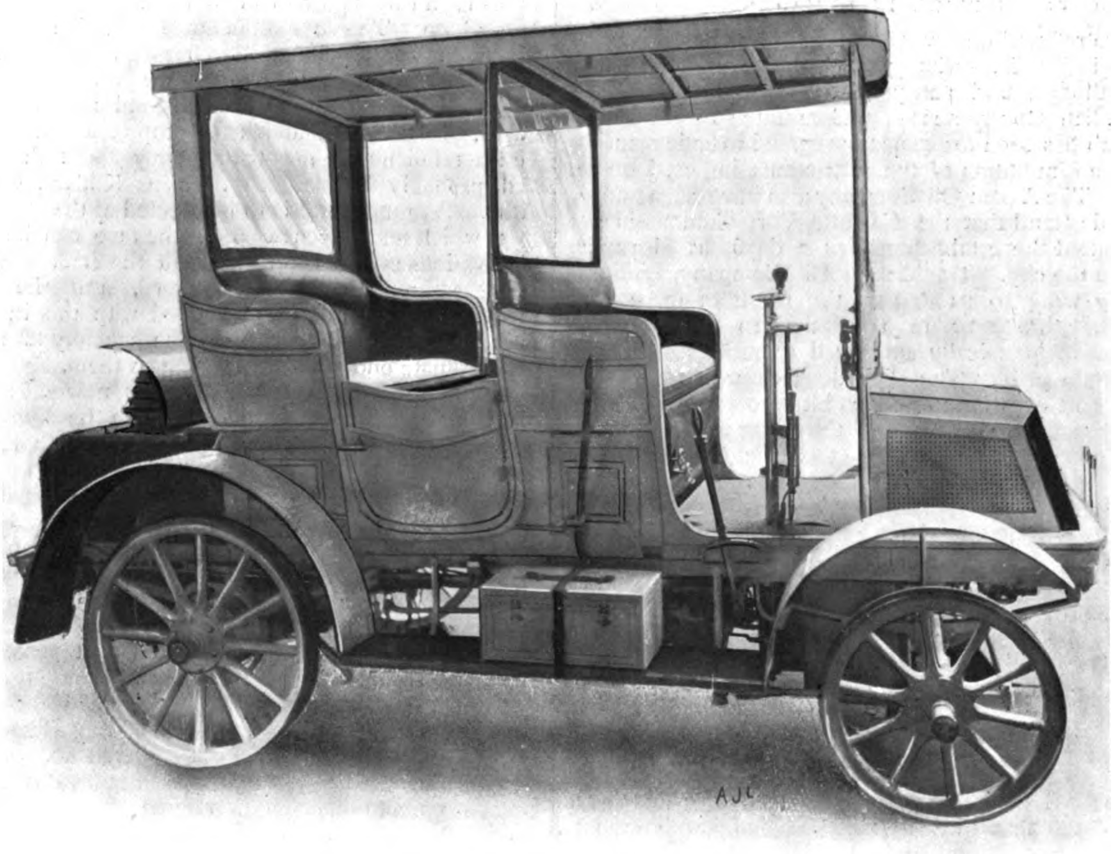
THE Special Racing Committee appointed by the Automobile Club to finally settle the exact route of the race, fix controls, &c., have completed their preliminary labours, and it has been decided to omit the rough road from Kilcullen to Kildare, through the Curragh, thus making the course three times round the figure of eight loop, and once round the larger loop. The complete course will, therefore, be from Kilcullen to Kildare, Maryborough, Athy, Kilcullen, Carlow, Athy, back to Kilcullen again. From Athy to Kilcullen is a straight run of twelve miles, with only one bad curve, which is fortunately at the top of a hill, where it will be least difficult to negotiate. Only about three controls will probably be necessary, viz., at Kildare, Carlow and Athy. A grand stand is to be erected at the starting place, from which magnificent views of the race can be obtained. The various events connected with the Irish Fortnight are being strenuously pushed forward, and the round of festivities which will be associated with this International event are likely to live long in the memory of those who are fortunate enough to participate in them.

A trophy of the value of £200 is now offered by the Hon. John Scott Montagu, M.P., to be known as the "Montagu" Trophy as a second prize in the Race. The original suggestion was that it should go to the second car, but it is possible upon fuller consideration that instead it may be awarded to the club whose team achieves the best results, as it is suggested that a car of one nationality might come in first, but the second, third, and fourth places might all three be gained by another nation, in which case that nation should secure the Montagu Trophy. Unofficially, this new trophy has been welcomed by representatives of the French Club who are at present in London.

April 10th, the original date specified for cars to be ready to take part in the Eliminating Trials in connection with the race will be adhered to, as the Star Engineering Company, one of the entrants, do not see their way to agree to this condition being altered, and therefore no other cars except those made by this Company, and S. F. Edge, Ltd., can participate in these Eliminating Trials. Subject to the approval of the Duke of Portland, the Eliminating Trial itself will take place at Welbeck on April 25th, when Mr. R. E. Phillips' electrical timing apparatus, as further improved by him, will be tested. The representatives of the various Clubs on the International Commission are as follows:—For France, Count R. de Vogue; for Germany, Graf Ad. von Sierstoppf; for America, Mr. Clarence Gray Dinsmore with Mr. J. Howard Johnston as alternative; for England, Mr. Paris Singer with Mr. Julian Orde, the new Club Secretary, as alternative. Special committees to deal with the various leading events in connection with the Irish fortnight will be appointed, including the speed trials in Phœnix Park, the races and gymkhana on the Phœnix Park race course, the hill climbing trial and Castlewellan 4-mile speed trial, the Cork speed trial, and the Kerry hill climbing trial. This latter it may be specially noted is for touring cars only, and last year's racing cars, even if fitted with touring bodies, will not be eligible to compete.

THE Gordon-Bennett Race Bill on Monday passed the report stage and on Tuesday its third reading in the House of Lords, the Bill therefore now being completely assured, as the approving of the Bill in the Commons amounts to practically a matter of form.

THE CHABOCHE STEAM CARS.—PART I.



Photograph by Argent Archer, Kensington.

Fig. 1.—The 12-h.p. Chaboche Steam Car.

We have on more than one occasion referred briefly to the Chaboche steam cars, but hitherto no detailed description of them has appeared in print, and we have been unable to obtain the necessary data for dealing with them ourselves. Now, however, that Mr. A. E. Hodgson has secured the British agency for his Company—the General British Depôt of 94, Victoria Street, S.W.,—we have been given every facility for describing the system and the mechanism employed, and this we shall do with the aid of photographs which we have taken, and drawings which we have prepared from data supplied to us. The cars are being put upon the market in England in two different sizes, the one type having an equipment nominally of 12-h.p., and the other of 20-h.p.; a complete 12-h.p. car and a chassis of the same size are now on view at the Agricultural Hall Exhibition, and the photographs which we reproduce were taken from those identical machines. The Chaboche car resembles the Gardner Serpollet (which we described in a series of articles last year) very closely in outward appearance. It gives, however, the impression of being more lightly constructed, and the similarity between the two is only skin deep, for the driving mechanism is constructed and arranged in an entirely different manner.

In both systems a flash type of steam generator is employed, and it is fixed at the rear of the main frame in both makes of car. The water tank, moreover, is arranged in front and is usually covered by a bonnet. The fuel in both cases is paraffin, and the feed water is used over and over again by condensing the exhaust steam and returning the water to the fuel tank. Here, however, any common characteristics of the two systems cease, for the construction of the boiler, the burner, and the engine are totally dissimilar, and the method of transmitting the power to the rear wheels and of automatically controlling the various parts is very different.

The features which are peculiar to the system are the employment of helically wound coils for the generator, of separate vaporisers for each of the six burners, of a double-acting engine having ordinary slide-valves, of a two-speed gear between the crank-shaft and the universally-jointed

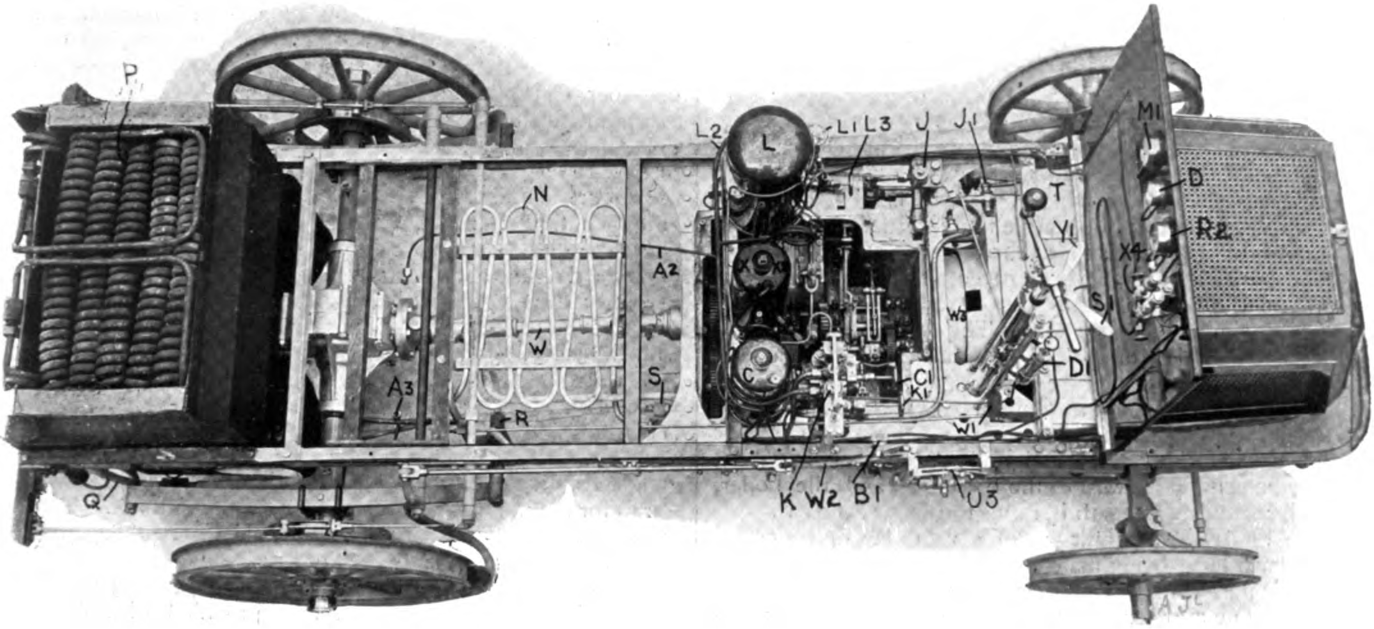


FIG. 2.—Plan View of the 12-h.p. Chaboche Steam Car.

propeller-shaft, which drives the rear axle, of a fan on the front end of the crank-shaft for drawing air through the condenser, of pressure chambers for the feed water, the fuel, and the lubricating oil, of a foot "accelerator" pedal by which the boiler pressure can be increased at will, and of automatic devices (1) for regulating the heat of the burner in accordance with the temperature of the steam, and (2) for controlling the water feed to the boiler according to the steam pressure.

In any system of this kind it is difficult to give a lucid description without conveying the impression that the mechanism is complicated. This difficulty is in many cases emphasised by the existence of numerous regulating devices which are not as a rule required, but which are provided for use under exceptional circumstances only, or for enabling a skilled driver to obtain the best effect possible from his car. In the present instance the system adopted is particularly ingenious and a high degree of automatic action has been secured, coupled with means for varying the power of the generator according to the requirements at the time. In order to avoid confusion we propose in the first place to consider the Chaboche system briefly and generally, and afterwards to describe the various parts and their inter-connections in detail. We shall therefore restrict

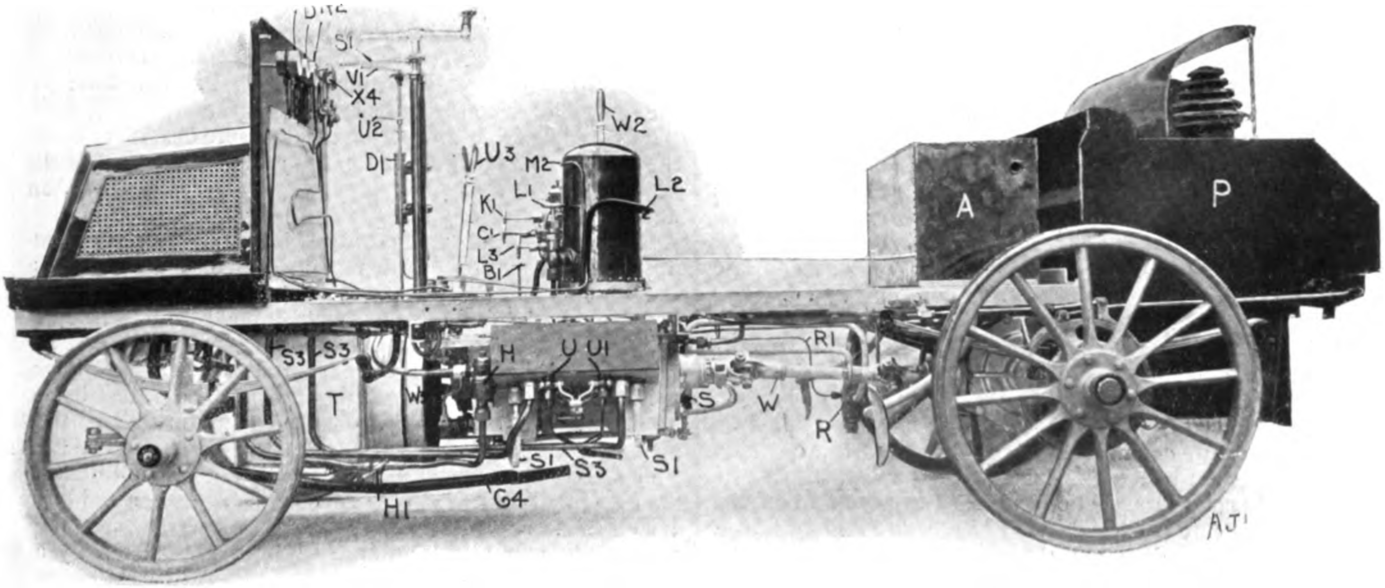


FIG. 3.—Side View of the 12-h.p. Chaboche Steam Car.

ourselves for the moment to the functions of the different devices, and shall explain their construction later.

One of the 12-h.p. vehicles is seen in Fig. 1, and in Figs. 2 and 3 we give a plan and a side view of the chassis; subsequent illustrations will not only show the various parts on a larger scale but will fully demonstrate the system diagrammatically. In Fig. 2 the boiler casing and the fuel tank have been removed, and in neither illustration is visible the foot accelerator, which will be referred to in due course, as it was not fitted to the chassis at the time.

The main frame, which is constructed of channel steel, is rectangular in shape and has several cross members having a similar cross-section. The water tank is fixed upon the frame in front. The condenser, T, is suspended from it immediately behind the front axle. The engine and gearing are enclosed in an aluminium casing which is fixed beneath the frame; the casing is arranged almost centrally between the axles. The fuel tank, A, lies across upon the frame slightly forward of the back axle, and the boiler, P, with its burner beneath it, forms the back of the car.

The boiler, P, is built up of several layers of coiled tubes, each layer being made from a single length of weldless steel tubing. In alternate layers the coils lie at right angles to one another, and the lowest coil of the boiler is a flat grid which is very similar to a section of the Gardner-Serpollet generator. The water is taken from the main supply tank through a small cooler beneath it, and is delivered either by a hand-pump, J (which is seldom used), or by a pump driven by the engine to a pressure drum, L. The drum contains a cushion of air and is normally in free communication with the boiler coils, so that the water can flow from it to the boiler or *vice versâ*. The delivery from the pumps to the pressure chamber is regulated by an automatic device, K, which byepasses a certain quantity of the water back again to the supply tank, according to the steam pressure. The boiler pressure is thus automatically maintained at an approximately constant degree, because the supply of water to it is reduced as its pressure rises, and because the water can be forced back from it to the pressure-drum, L. The pressure which is actually maintained can be increased by depressing a foot-pedal, which increases the strength of a spring holding the relief valve down. A shut-off cock, K, is provided between the pressure chamber and the boiler, and the communication between them is made through a coiled copper pipe, N, which is seen in Fig. 2. This pipe is very thick, and is thus capable of storing up a certain amount of heat when water passes back through it to the pressure chamber; it again gives up its heat to the water when it flows in the opposite direction. A gauge, M^1, on the dash indicates the pressure in the chamber. The burner consists of six separate jets, each of which has its own vaporiser. The jets are arranged in groups of three, so that either set alone or both can be used. The vaporisers are initially heated by methylated spirit, and are constructed for burning ordinary lamp oil when in use. The fuel is drawn from the main tank, A, and is forced by a mechanically-operated pump, B, into another pressure-chamber, C. The pressure in this chamber is kept constant by a spring-loaded relief valve, which byepasses oil back to the suction side of the pump when the desired pressure is exceeded. The pressure is shown by a gauge, D, on the dash, and the quantity of air forming the cushion in the chamber can be maintained as it becomes absorbed in the oil, by a hand-pump, D^1, on the steering pillar. The actual pressure can be varied by the driver by means of a small handle, B^1, which enables him to vary the strength of the spring holding the relief-valve down. The fuel flows from the pressure-chamber, C, through a hand-regulated needle-valve, C^1, and an automatically-controlled valve, E (not in Figs. 1 and 2), to the burner, this latter valve being regulated by the temperature of the steam in the pipe, Q, leading from the boiler to the engine. The valve, E, is so constructed that it cannot entirely cut off the fuel, and that sufficient oil can always pass through it to keep the burner alight. The steam pipe, Q, is fixed rigidly at its one end to the frame, and is enclosed in a steel tube, Q^1, for a considerable part of its length. As its temperature increases it expands, and it is connected with the valve, E, in such a manner that it then closes it.

The steam is led through the expansion pipe to a safety valve fitting, R, and from there to a throttle valve, S, which is controlled by a hand lever, S^1, on the steering pillar. A small pipe, R^1, also leads from this fitting to the pressure gauge, R^2, on the dash, and it is so constructed as to form a trap for any foreign matter which may pass into it. The steam is led from the throttle valve, S, by two separate pipes, S^2, to the cylinders of the engine.

The engine consists of two double-acting cylinders covered by a light casing, U, and provided with slide-valves controlled by reversing gear of the Stevenson link type. The reversing gear is operated by a side lever, U^3. Drain cocks, U^1, are controlled by a small lever, U^2, on the steering pillar. The crank shaft is enclosed in an aluminium casing, to the sides of which the cylinders are bolted at an angle. The crank shaft is fitted with three spur wheels, two of which are at all times in mesh with corresponding wheels on a lay shaft, and the third drives the shaft operating the water and fuel pumps. The lay shaft is geared to the longitudinal shaft, W, and a two-way jaw clutch introduces the high or the low speed gear between it and the engine. The change-gear is operated by a lever, V^1, on the steering pillar. The exhaust steam pipes, S^3, lead from the engine to the condenser, T, and the water or steam from it are forced up into the water tank by the pressure of the exhaust. Air is drawn through the condenser by a fan, W^3, on the front end of the crank-shaft.

The cylinders are lubricated through pipes leading from a sight-feed fitting, X, on the dash board to the two steam chests. The oil is carried under pressure in a chamber, X, the bottom of which is connected through a cock, X^1, with the feed pipe, L^2, leading from the pressure chamber, L, to the boiler. The oil floats upon the water, and is forced at boiler pressure through a pipe, X^3, to the lubricator, X^3, and thence to the engine.

The general arrangement of the chassis does not call for any special mention. The rear axle is of the live type; the differential gear is arranged centrally and is driven by bevel gearing from the universally-jointed and telescopic shaft, W. Semi-elliptical side springs are used both in front and behind, and no distance rods are employed for connecting the rear axle with the frame. The rear wheels are larger than the front wheels, and they are all of the artillery pattern. Double-acting side brakes are provided; they are connected with the foot pedal, W^1. Spoon brakes are also fitted for use in case of emergency or for holding the car stationary on an incline. They press against the tyres of the rear wheels and are brought into action by a side lever, W^2.

(To be continued.)

THE "SOAMES" PETROL CAR.—PART I.

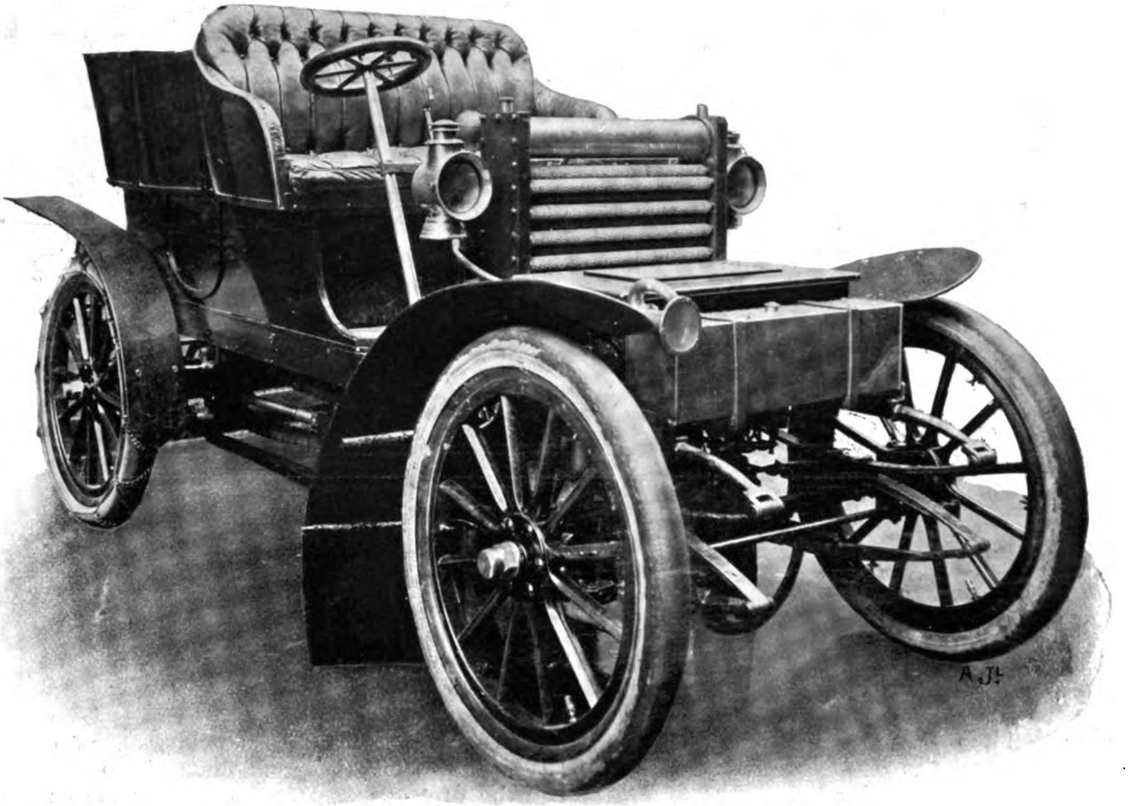


Fig. 1.—The "Soames" Petrol Car.

We referred briefly to the "Soames" car in connection with our description of the Exhibition at the Crystal Palace, where it was first shown, and we gave an illustration of the chassis in our issue of February 7th last. Since that time certain modifications and improvements have been made, and we are now able to give a full description of the car. Pressure on our space, however, prevents us from completing our article this week, and we are also bound to hold over some of the illustrations, which we have prepared from our own photographs, and in which certain portions of the

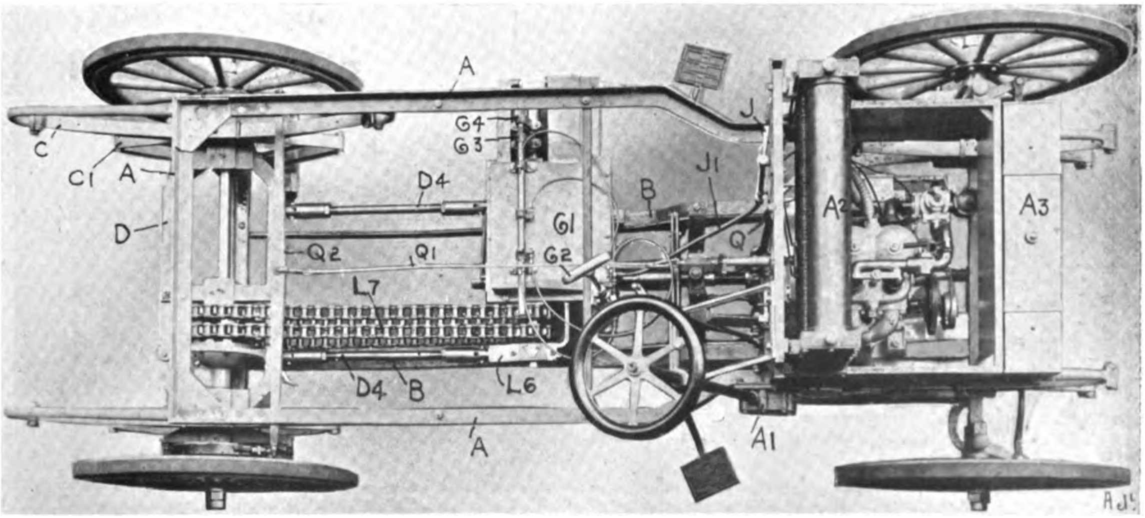


Fig. 2.—Plan View of the "Soames" Petrol Car.

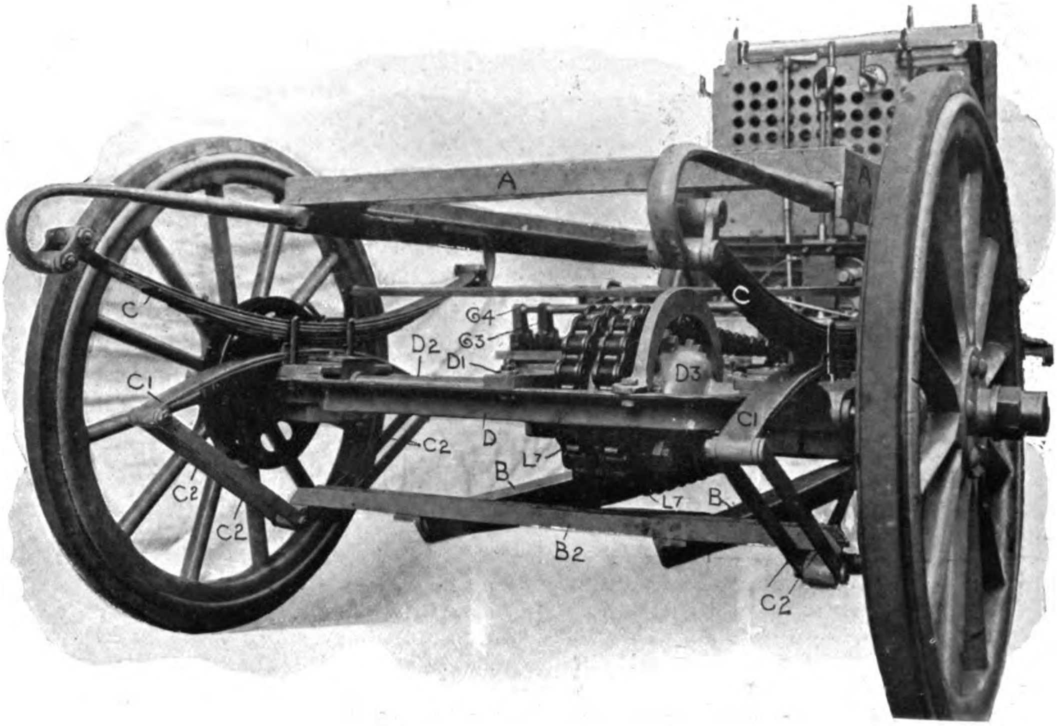


FIG. 3.—Rear Portion of the "Soames" Chassis.

mechanism are more clearly shown. These further figures will be found useful in order to obtain a thorough comprehension of the arrangements of the parts, and they will accompany the second part of this article.

In many respects these vehicles differ radically from any others that have been put upon the market, and the whole problem of motor car construction has been taken up by the designers and manufacturers from an original standpoint. The most important innovation is the arrangement of the driving mechanism, including the engine and the change-speed gear, upon an entirely distinct underframe which is suspended beneath the front and rear axles from

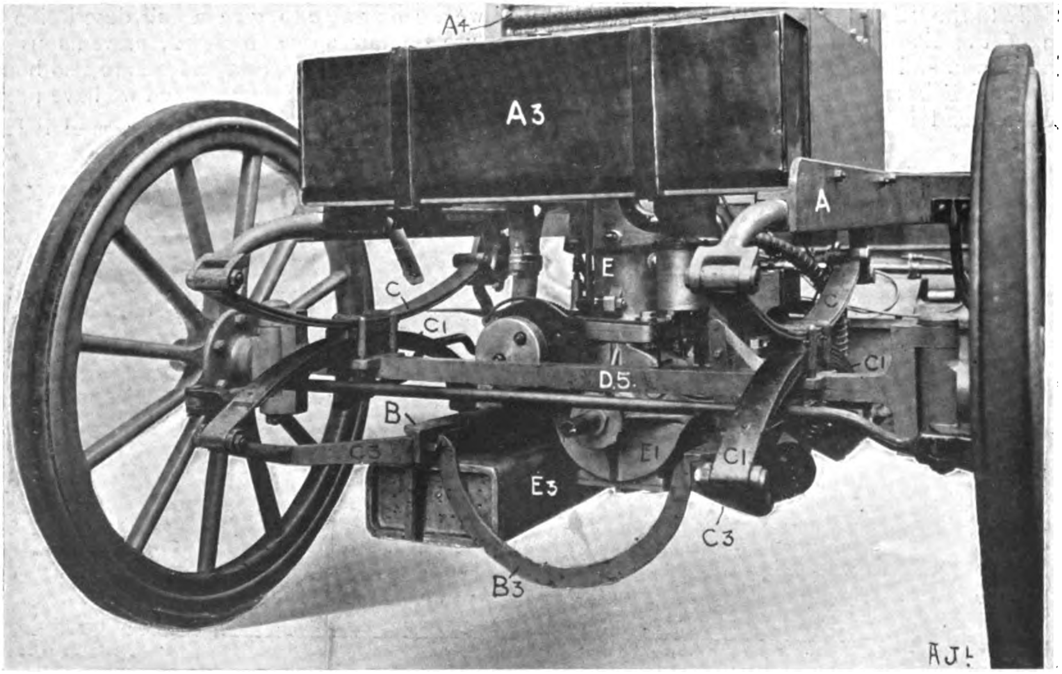


FIG. 4.—Front Portion of the "Soames" Chassis.

semi-elliptic springs fixed to them. The body, the tanks, and the controlling levers are all fixed to the main frame, and it is suspended above the axles in much the usual manner. Flexible connections are in all cases provided for connecting the controlling levers on the upper frame with the parts which they actuate on the lower frame, and considerable ingenuity has been exercised in order to obtain simple forms of construction for these connections.

The engine is not in itself unusual, but the method adopted for regulating its power, by hand, is an interesting feature. The volume of the explosive charge is varied by regulating the tension of a spring which tends to close a valve through which the mixture passes to the inlet-valves, and another valve is fitted alongside it in such a way that cold air is admitted to the cylinders when the explosive mixture is entirely throttled.

The change-speed gear is another interesting feature of the car, the power being taken through bevel gearing to the first-motion shaft and through one or other trains of spur gears (which are always in mesh) to a second-motion shaft, and then to the differential gear of a live rear-axle by a pair of heavy chains. The wheels on the second-motion shaft ordinarily run freely upon it, but either of them can, alternatively, be locked to the shaft by a sliding internal key. This method of rendering one or other spur wheel rigid with its shaft is already well known in connection with the M.M.C. cars, and a few others, but the manner in which it has been carried out in this case is very different, and a special device is employed for fixing the sliding key firmly in place when it is in engagement with either wheel. A peculiar type of brake is operated by the foot pedal. It is fitted between the main clutch and the gear box, and consists of a disc against the edges of which a double lever presses, instead of being a drum having a brake band. Another unusual provision made upon the "Soames" car consists of a handle on the dashboard, which enables the driver to lock the main clutch out of engagement when the car is standing still, thus allowing the engine to run quite freely at such times.

The manner in which this and the other novel characteristics above mentioned are carried out will be dealt with in detail as we come to them in the following description.

The "Soames" car is an addition to the growing list of essentially British automobiles which are slowly but surely making their appearance as time goes on. We have on several occasions referred to such machines and have expressed the opinion that sooner or later they will replace cars of foreign construction in the favour of the English public, since the main objects strived at in their design are reliability, durability, and comfort rather than any capability of attaining sensational speeds.

Fig. 1 represents one of the cars complete; a chassis is seen in plan in Fig. 2, and will subsequently be shown from either side in Figs. 6 and 7. In Fig. 3 the rear portion of the chassis is seen, and in Fig. 4 the front portion. Fig. 5 is given in order to demonstrate the construction of the back axle.

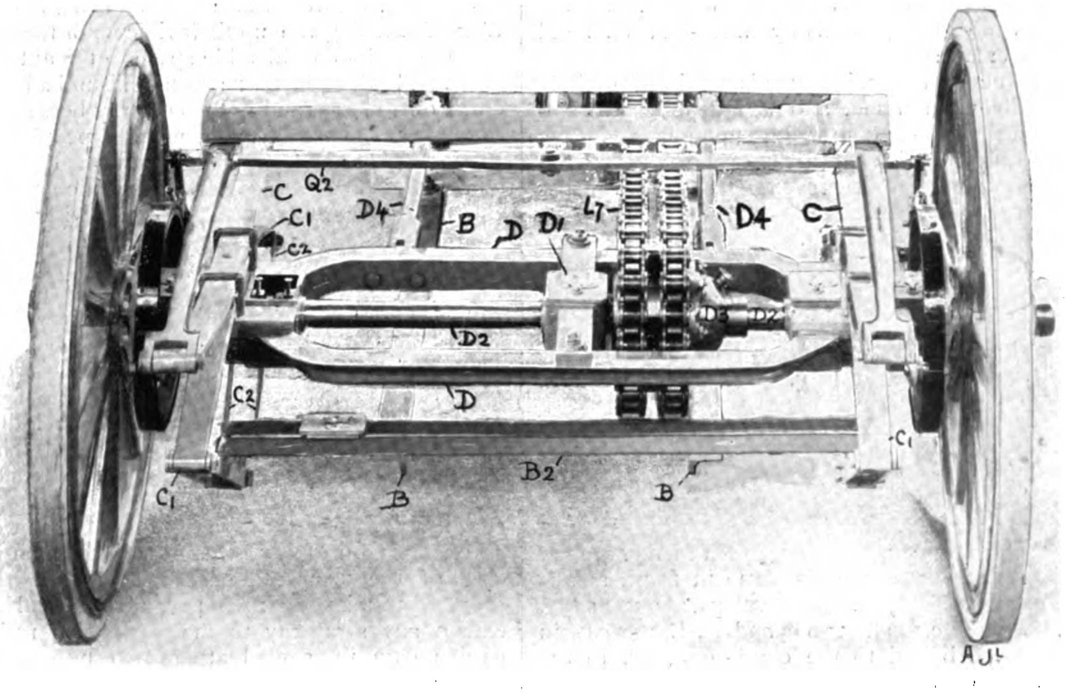


FIG. 5.—The "Soames" Car. View showing the construction of the back axle.

The main frame, A, is built up of ⊢ section steel, which is 4 in. deep by 2 in. wide, the metal itself being ⅜-inch thick. It is somewhat narrower in front than behind the driver's seat, and is stiffened with angle plates at the corners, and by a cross member. The steering gear, A^1, is fixed rigidly to its outer surface, and the steering pillar is supported beneath the wheel by a bracket which is fixed to the dash. The dash itself is made rigid by a steel forging forming its edge on this side of the car, and secured firmly at its lower end to the frame. The steering pillar is somewhat further to the right than usual, but being fixed to a narrower portion of the frame is conveniently placed. The dashboard also carries a combined water-tank, A^2, and radiator, A^4, and is perforated in order to allow the air to pass around the cooling tubes. The regulating levers and pedals are fixed to the main frame, and are so arranged as not to interfere with the removal of the body. The petrol tank, A^3, is also fixed to the frame, A, in front. The frame is supported by semi-elliptical side springs upon the front and rear axles. Other semi-elliptical springs, C^1, are secured between the springs, C, and the axles, but they are inverted, as seen in the illustrations. The springs, C^1, carry an underframe consisting of two longitudinal angle members, B, having cross members, B^3 and B^4, at each end; the cross member, B^2, at the rear has a channel section, and its ends are connected with the side springs, C^1, by long links, C^2. The cross member, B^3, in front, is a forging which bows downwards at its centre and ties the longitudinal members, B, together. The underframe is fitted with projecting horns, C^3, in front, which are connected with the forward ends of the springs, C^1, and with brackets riveted to the members, B, for carrying the rear ends of those springs on shackles. The longitudinal members are not straight, but are bent to a higher level in front than behind, and are stiffened across the bent portions by flitch-plates riveted against their inner faces.

By this construction the underframe is rendered entirely distinct from the main frame, and is independently suspended beneath the axles. The weight upon it, therefore, tends to deaden any vibration of the wheels and axles, and the springs between them and it prevent shocks from being transmitted to the mechanism.

The rear axle (Fig. 5) is formed of two angle-members, D, which connect the outside bearings at each end of the live axle together, and carry an intermediate bearing, D^1, between them. Together with the bearings and a bridge, which is seen in Fig. 3, they form a very strong framework in which the live axle, D^2, revolves. All the bearings are ring lubricated, and have a large oil capacity. The outside bearings in particular are exceptionally long. The two portions of the live-axle are connected together by a differential gear, D^3, in which four planet bevel-wheels are fitted; the bevel-wheels in this gear are of unusual size. The front axle, D^5, is quite straight, and provides steering heads at each end in the usual way; it is clearly seen in Fig. 4.

The engine is fixed to the underframe in front, and is of the 2-cylinder vertical type. It develops about 11 h.p. at 800 revs. per minute. The two cylinders, E, are cast in one piece, and are bolted to the crank-shaft, E^1, in the usual manner. The cooling water is circulated through flexible pipes and the cylinder jackets from the radiator, A^4, by a pump, E^4, which is driven by friction off the flywheel. The exhaust box, E^3, is fixed beneath the underframe, in front, close up to the engine. The flywheel, E^2, forms the female member of the main friction clutch. The clutch is of the cone type, and is normally held in engagement by a spring. Flat springs are fixed to the male portion in such a manner that it can be brought into engagement gradually by the foot pedal. The connection between the foot pedal and the sliding portion of the clutch is so arranged that it is unaffected by the relative motions of the main frame and of the underframe.

The gear-box, G, is also fixed to the underframe, and is bolted down to its two longitudinal members, B. The box is also connected with the rear axle by large distance-rods, D^4, which are provided with right and left hand threads at either end for obtaining the necessary degree of tightness of the chains.

(*To be continued.*)

THE MANCHESTER AUTOMOBILE CLUB.

THE Manchester Automobile Club held their third annual dinner last week at the Albion Hotel, when Mr. Frederick Smith of Bowdon, the Chairman of the Club, presided over a very large number of guests, including Col. Dixon (Chairman of the Cheshire County Council), Mr. Alderman Rudman (ex-Mayor of Salford), Mr. George Milner, Mr. A. F. Bird (London Club Committee), Mr. T. W. Grace, Mr. S. Okell, Mr. Henry Edmunds (London Club Committee), Mr. Harry Nuttall, Mr. W. E. Rowcliffe, and Mr. Norman Fletcher. The Chairman, in proposing "Automobilism," during an extremely entertaining and amusing speech, mentioned that whereas last year the Club had only 80 members, this year the number had increased to 150. He was pleased to say that automobilism was now being recognised as a sport not to be ashamed of. There was sport in driving, in fishing, and in shooting, and he thought there was also sport in driving a motor car. Even the staid and dignified *Manchester Guardian* had given up their ridicule of the motor car, and now devoted a considerable space to the automobile movement. He thought that automobilism had made its way on its own merits, and not necessarily because it numbered amongst its advocates many notable people, including the Prime Minister and people distinguished in other walks of life. He ridiculed the speed limit which pertained in the country, and denied that automobilists wished to monopolise the roads. They advocated forbearance to all foot passengers and other users of the road, even to the waggoner who was invariably found to be on the wrong side, and the driver of the hooded van who, lost among his groceries, could neither see behind him, on either side, nor in front. They exercised forbearance even to men like that, and also to foot passengers who assembled for conversation in the middle of the road and discussed politics at street corners. They had, however, not much sympathy with the man who stepped off the foot-path on the near side without looking to see what was coming. With people who were in the habit of doing this he was inclined to think that as time went on it would be a case of the "survival of the fittest," as they must be prepared to take the risks that they ran. Neither did he extend any sympathy to the dog which rushed out of a garden gate in a mad attempt to bite a piece out of one's wheel. Anything that dog got he richly deserved. Mr. A. F. Bird acknowledged the toast, and amongst other speakers were Mr. George Milner, Col. Dixon, Mr. T. W. Grace, Mr. Alderman Rudman, Mr. O. Okell, Mr. Henry Edmunds, and Mr. W. E. Rowcliffe. Mr. Edmunds was particularly happy in his reference to one of the dangers which automobilists had to deal with, viz., the new man. They got a man who was on the road for the first time in possession of something which he had never had hold of before, and which possessed no brains and had not even horse sense. It was a good thing if they could institute some arrangement by which they could distinguish the new man. He suggested that the new man might carry a green flag. Another type of man might carry a red flag as a warning of danger, and then he would have a further flag, the quarantine flag, which could be a yellow one, which could be used to indicate that assistance was needed. They might also have a white flag with the colours of the local clubs upon it showing that the man was a competent driver. And when the police saw a flagless car they should challenge it. It would be a pirate.

THE MIESSE STEAM CARS.—PART II.

CONTINUING our description of last week, in which we briefly explained the Miesse system, and showed the general arrangement of the mechanism, we now propose to give further constructional details with the aid of Figs. 7, 8, 9, and 10. We also publish an illustration of one of the latest Miesse vehicles (Fig. 6), which is fitted with a body made by Messrs. Rothschild and Co., and has been on view at the exhibition in Islington during the week.

The engine itself, together with the differential countershaft driven by it, and the water and air pumps, is seen in Fig. 7. The cylinders have in this illustration been cut in half in order to show the pistons in place, and the pistons are not fitted with their rings. The upper portion of the oil-tight casing enclosing the cranks and other moving parts has also been removed, so that they are exposed to view. A complete cylinder casting, A, is shown in Fig. 8, with the inlet valves, A^1, and the exhaust valves, A^2, in place. Removable caps fit above each valve, and the steam and exhaust pipe connections are made to each set of valves at A^3 and A^4 respectively. On the latest castings the pipes are fixed by flange joints instead of with threaded unions as before. The steam enters at A^3, and finds its way to the pressure gauge through V^4, there being a direct passage through the casting from one flange to the other. The cylinder casting is by no means an easy one to make, and has several awkward cores in it. The steam enters through ports on the upper sides of the cylinders, and is led out to the exhaust valves on the under side. The casting is bolted to the casing, B, which encloses the cranks and the gearing.

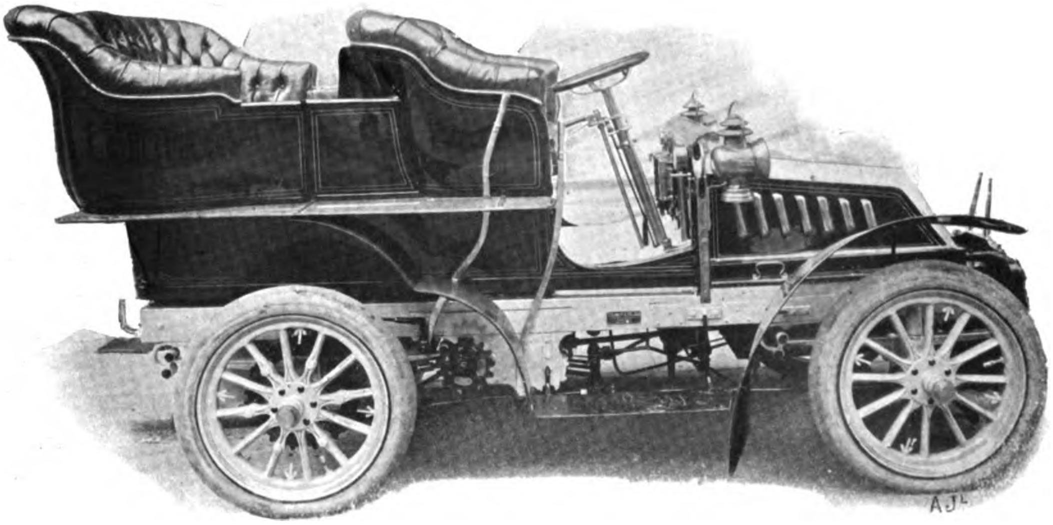


FIG. 6.—A Miesse Car fitted with Rothschild Body.

The crank-shaft is shown separately in Fig. 8. It is made from a single forging, and is in one piece from end to end. The crank pins, which are arranged at an angle of 120° from one another, are machined out in such a way as to leave circular discs each side of them. The shaft is supported in three phosphor bronze bearings, and has a separate crank bolted on its one end for working the air pump, D, the brake drum, X, being fixed to its other end. Two spur wheels, B^1 and B^2, are mounted upon it between the two bearings on the one side of the cranks. The wheel, B^1, meshes with a corresponding wheel, E^1, which is fixed to the shell of the differential gear; the differential is supported on each side by bearings formed in the casing, B. The casing is bolted down to two cross channels, G^1, which are fixed at each end to the brackets, G, by which this portion of the mechanism is secured rigidly to the side members of the frame. The brackets, G, carry the outside bearings for the two halves of the countershaft, E, and they also receive the shackles for the rear springs, the distance rods to the back axle, and the transverse shaft which operates the side brakes.

The gear wheel, B^1, is approximately half the diameter of the wheel, E^1, and therefore the countershaft, E, is driven at about half the engine speed. The spur-wheel, B^2, gears with a wide toothed wheel, B^3, mounted on a lay-shaft in the box, and this wheel drives the two cam-shafts which operate the inlet and exhaust cams respectively. The cam-shafts are formed out of steel rods, the cam faces being cut into their surfaces. The shafts slide freely longitudinally in the crank-chamber casting, and are therefore easily removable. Each cam-shaft has a spur-wheel on its one end, the wheel, B^5, on the exhaust cam-shaft being seen in Fig. 7. The spur-wheel, B^3, is of sufficient width to allow for the full longitudinal movement of the cam-shafts and their spur-wheels, so that it remains in mesh with the wheels at all times. The cam-shafts are simultaneously moved longitudinally by a fork piece, B^6, which engages collars on both of them, and the forked piece is itself operated by a lever arm, which is not shown in Fig. 7 but is fixed to the vertical spindle, C^3, previously referred to and seen in Fig. 5 (last week). The inlet cams are so shaped with varying profiles that they have a neutral longitudinal position in which they fail to open the valves at all. When slid in one direction they cause the engine to run forwards, and in the other direction to run backwards. For the forward direction they not only open the valves at the beginning of the outward strokes of the pistons, but they allow them to close later during these strokes according to the distance the shaft is moved, thus varying the "cut-off." The exhaust cams are shaped so that they hold the exhaust valves slightly open when in their neutral position, and allow for running backwards and forwards when slid longitudinally in one direction or the other. The object of holding the exhaust valves open when the reversing lever is in its neutral notch is to allow the engine to run freely when the car is running downhill; the pistons can then move backwards and forwards in their cylinders without producing any vacuum.

The air pump, D, is fixed to one of the brackets, G; its piston, D^1, connected with the crank-shaft, is shown in Fig. 8. The feed-water pumps, F, as shown in Fig. 7, are fixed to one of the channels, G^1, and the piston, F^4, of the one pump is operated by the eccentric, F^1, on the counter-shaft, E. The piston, F^3, of the other pump is operated by the hand-lever, F^2, shown in our illustrations of the chassis; the lever fits over a squared portion of the shaft, F^7, to which the plunger, F^3, is connected by a lever-arm. The two water pumps have separate suction valves beneath them and they also have separate delivery valves, which are arranged beneath the screw caps, F^5. The water passes from the pumps through the pipe connection, P^2, to the hand-controlled by-pass, R, and it passes through an additional delivery valve beneath the cap, F^6, and through the pipe fitting, P, in order to go (1) to the boiler, (2) to the relief valve, S, and (3) to the safety valve, Q. The valve beneath the cap, F^6, thus forms a non-return valve between the boiler and the pumps, and prevents the boiler pressure from forcing water or steam back through the by-pass, and the condenser, to the water tank.

The cylinders of the 6-h.p. engine have a bore of $1\frac{15}{16}$ inches and a stroke of $3\frac{1}{8}$ inches, those of the 10-h.p. engine have a bore of $2\frac{5}{16}$ inches, and a stroke of $3\frac{1}{2}$ inches. The gear ratio between the crank-shaft and the road wheels is approximately 4 to 1, the counter-shaft running at about half the engine speed and the chain wheels on the 6-h.p. car having 15 and 35 teeth respectively, and on the 10-h p. 15 and 30 respectively. The "cut-off" can be varied up to about three-quarter stroke, and in practice is seldom reduced when running below about one-half, as experience has shown that the engine is inclined to "knock" if an earlier cut-off than this is given. It will be noticed that the pistons are provided with five rings and that they are unusually long. Very little steam appears to find its way past them, and any that does so is allowed to escape from the crank-chamber through a cock fitted to its removable cover.

One of the sections, M, of the boiler is shown in Fig. 8. There are seventeen of them in all, and they are laid horizontally above one another with the zigzag coils of alternate layers at right angles to the others. The tubes vary in thickness and are made of solid-drawn weldless steel. They are connected together without any removable unions, so that they form an endless tube when the boiler is built up. The joints are made by boring out the ends of the tube and inserting short ferrules between them, the ferrules preventing the joints from being broken by any jarring strains. The tubes meet one another outside the ferrules and are welded together by a special process, using a blowpipe fed with oxy-hydrogen gas. The joints appear to be thoroughly satisfactory and are remarkably strong.

The different layers of the generator are connected together in such a manner that the water enters the bottom one first. It then finds its way up through several of the sections before being led across some of the central sections to flow up through the upper sections. After passing

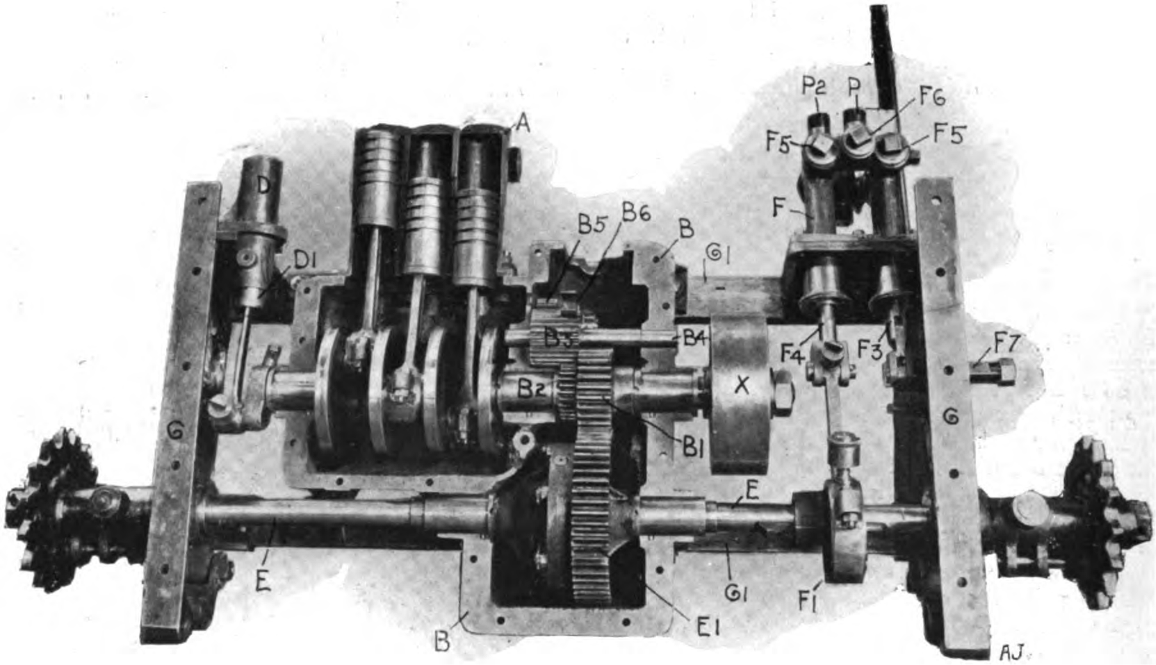


FIG. 7.—The Miesse Engine, Differential Countershaft and Water and Air-pumps.

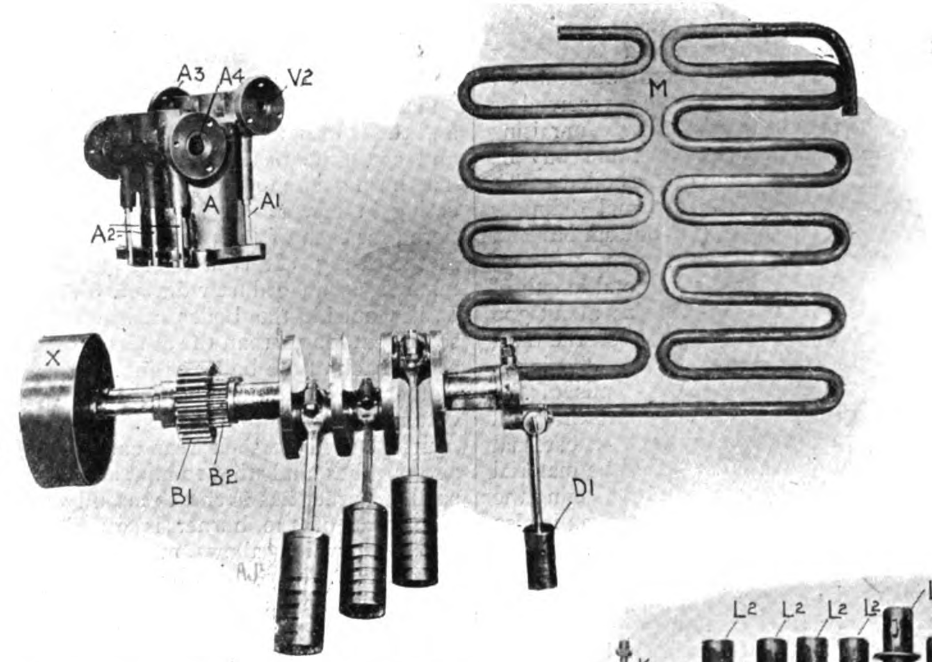


FIG. 8.—The Miesse Cylinder Casting, Crank-shaft with Pistons, and Generator Section.

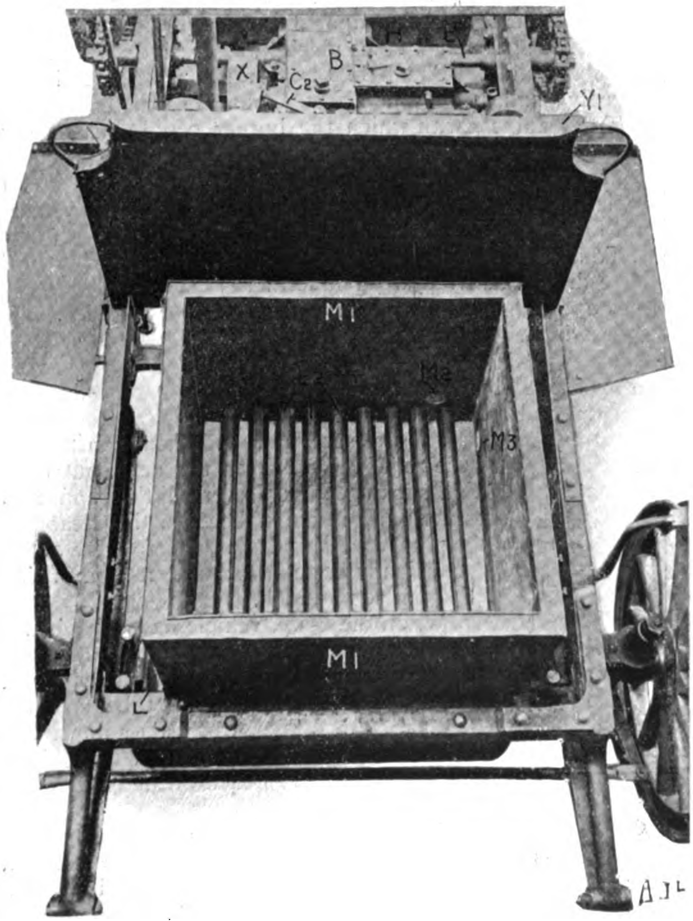


FIG. 9.—The Miesse Boiler Casing, with Burner, in position.

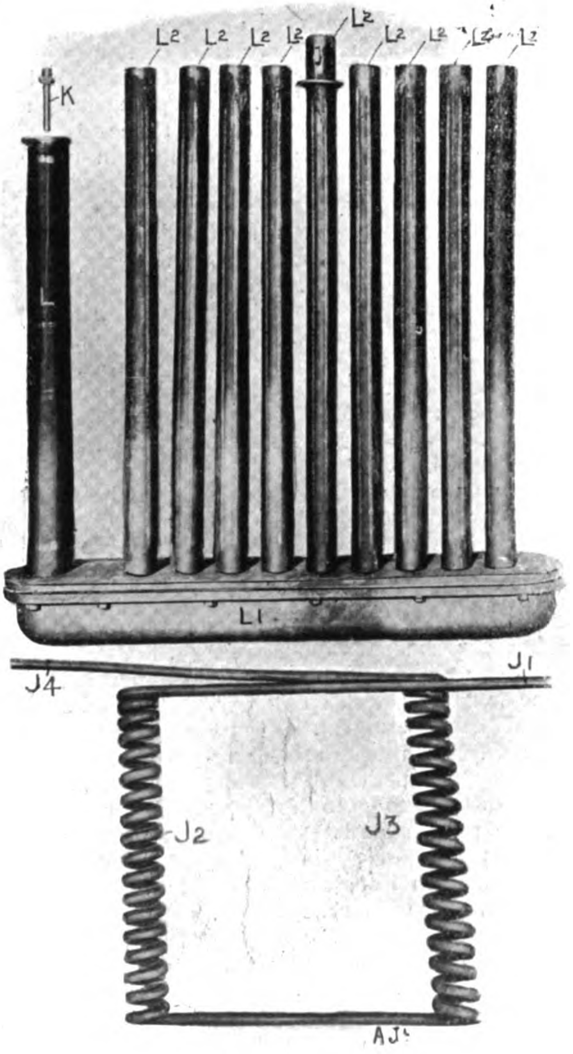


FIG. 10.—The Miesse Burner, with Nozzle, K, and Vaporiser.

through the top sections it is brought down again to the lowest of the intermediate layers through which the steam then passes upward before being led to the engine. The lowest tubes may thus be roughly regarded as feed-water heaters, and are therefore not liable to become burnt under ordinary working conditions. The top layers receive less heat from the burner, and may be called the steam-raising coils. The intermediate coils may in the same way be looked upon as the super-heater portion of the boiler. The tubes vary in thickness, although the external diameter throughout is about $\frac{3}{4}$ in.; those at the bottom have an internal diameter of about $\frac{5}{16}$ in., and the superheated coils of about $\frac{7}{16}$ in. In the 6-h.p. generator the total length of tube is about 200 feet, and in the 10-h.p. size about 300 feet. Owing to the difficulty of cutting threads on the ends of this tough tubing with ordinary dies, separate pieces, which are subsequently welded to the two ends of the generator, are "knocked up" at one end and are threaded in the lathe to receive the pipe fittings. The external steam piping is very short and is also of the same material as the generator tubes; any joints are made by flanging the tube itself inside the unions. Weldless steel tubing is also employed throughout the car for the fuel, air, and water pipes.

The generator is enclosed in a special casing, M^1, which is seen in place in Fig. 9. It is built up with an inner and outer sheet of steel, which are held together by channel steel frames top and bottom. The space between the metal sheets is filled up solid with layers of asbestos. The casing is fixed to two cross channels of the main frame. In the 6-h.p. vehicles it is 1 foot 8 inches long, wide, and deep. The 10-h.p. casing has the same depth, but is 2 feet 1 inch long by 2 feet 1 inch wide. The cover above the boiler tubes is formed of a plate having three large square holes in it. The plate is made to form the bottom of a horizontal flue, a second, bent, plate being fixed above it. This flue runs out through the bonnet in front, and is connected with a vertical flue passing down between the boiler casing and the hollow dash, the burnt gases from the boiler passing out through it beneath the car. The boiler is tested to a pressure of 1,200 lbs. per square inch.

The vaporiser coil is fixed beneath the boiler by "S" hooks, which pass round the generator tubes. It is shown separately in Fig. 10. The oil enters through the pipe, J^1, across the back, inside the casing, M^1, then through the coil, J^2, on the one side of the casing, and across the front to the coil, J^3. Both these coils lie above the burner. The latter is placed in line with a hole, M^2, in the casing, M^1, through which the flame of a blow-lamp can be introduced. The lamp is of the usual plumber's type, and a stand is provided for it to rest upon. The vaporised oil passes through the pipe, J^4, and through the hand regulator to the burner jet. The gas formed in the coil, J^3, when starting, has therefore but a short distance to go to the burner. The vaporiser is made of the same material as the generator tubes. It has an internal bore of $\frac{5}{16}$ inch, and an external diameter of $\frac{9}{16}$ inch. An inspection hole, M^3 (Fig. 9), allows the operator to see when the coil, J^3, is sufficiently heated by the blow-lamp to permit the paraffin cock, J, to be opened.

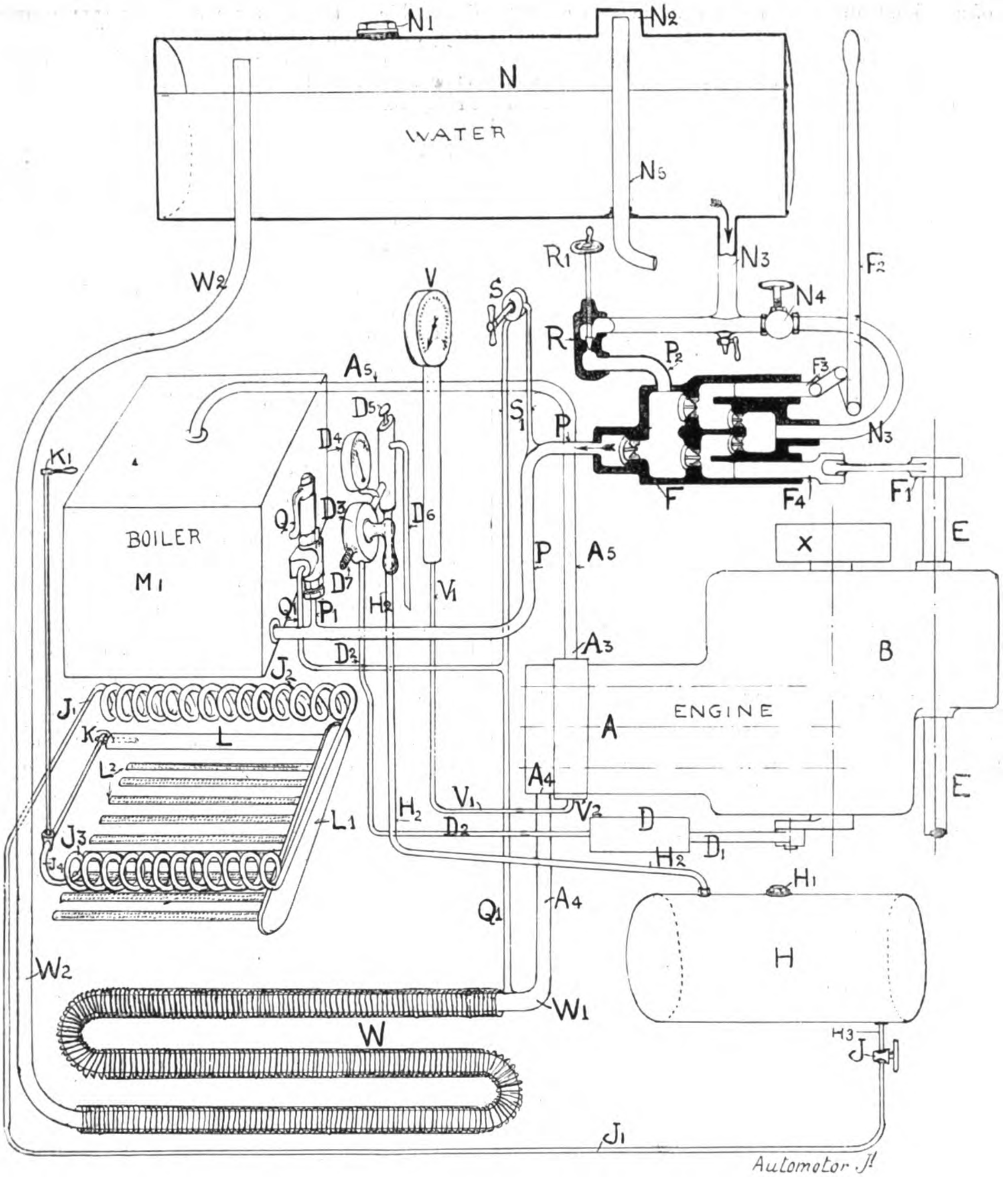
A good idea of the burner is obtained in Fig. 10, where the nozzle, K, through which the vaporised oil passes into it is shown withdrawn from the mixing pipe, L. This pipe, L, is open to the air at the end into which the nozzle, K, projects. The pipe leads into a chamber, L^1, which is made in two parts so as to allow the burner tubes, L^2, to be fixed into it, and to permit of cleaning out when necessary. The tubes, L^2, are perforated as seen in the illustration, the two external tubes having but one row of holes in them, and the other tubes having two rows. The mixture of gas and air issues out of these holes at an angle of 45 degrees, and the flames from each adjacent tube strike one another and cause the heat generated to be very equally diffused. The burner is shown in place in the bottom of the boiler casing in Fig. 9. It is slid in through holes which are bored for each of the pipes, L^2, in the front and the back of the casing. It is therefore put in place in just the same manner as an ordinary drawer. The mixture supply tube, L, lies outside the boiler casing. The central tube, L^2, is somewhat longer than the others, so that it projects through at the back of the boiler casing. It is slotted near its end so that the burner may be fixed in place by a wedge-shaped cotter key fitting in the slot. All the tubes, L^2, are, of course, closed at their rear ends. The 6-h.p. burner has seven tubes and the 10-h.p. has nine tubes. Even the smaller burner has over a thousand small holes in its tubes. The heat of the burner is varied entirely by the hand regulator, which allows more or less gas to pass to the nozzle, K. The gas can be completely cut off by this regulator, although it is, of course, necessary to leave it slightly open when the car is standing for a short time. In the event of the nozzle, K, or the vaporiser itself becoming stopped up by any small obstruction, it can usually be ejected by shutting the regulator right off for a few moments and then opening it suddenly. When closed the pressure rises considerably in the vaporiser, and when it is re-opened the rush of gas which takes place will frequently clear away the obstruction. The hole through the nozzle, K, is extremely small, being only about 1 mm. in diameter.

The readiness with which the burner can be taken out when necessary is worth calling attention to, the pipe connection to the nozzle and the cotter, behind the boiler casing, alone requiring removal before drawing the burner out forwards from the car.

The paraffin and water tanks are made of copper and have their ends riveted. The former is made of very heavy gauge and is tested to a pressure of over 120 lbs. per square inch. On the 6-h.p. car it holds 7 gallons, and on the 10-h.p. 14 gallons—sufficient for running from 100 to 120 miles. The water tank on the small car holds 18 gallons, and on the large 22 gallons—sufficient for about 80 to 100 miles. The pressure is not only kept constant in the fuel tank by the relief valve, D^5, on the dash, but even in the event of this sticking, there is very little chance of an excessive pressure being attained because the clearance space between the plunger, D^1, and the delivery valve of the air pump, D, is sufficiently large to prevent it from rising much above 60 lbs. per square inch.

The condenser, W, on the 6-h.p. vehicle has three banks of tubes, and on the 10-h.p. it has four; the banks are arranged behind one another and they are 8 tubes deep. There are, therefore, 24 horizontal finned tubes on the one and 32 on the other car. The steam passes downward from the top of the condenser to the bottom through all the banks in parallel, and through each of the eight layers consecutively.

The diagram (Fig. 11) which we have prepared of the complete system enables the various connections between the parts to be seen clearly. It will be noticed that no attempt has been made to introduce automatic controlling



The Miesse Steam System.

Diagram showing Steam, Water, Air, and Fuel Connections.

A, cylinders.
A^3, steam inlet.
A^4, exhaust pipe.
A^5, steam pipe.
B, crank-chamber enclosing differential.
D, air-pump.
D^1, piston of ditto.
D^2, delivery pipe from ditto.
D^3, 3-way cock for air.
D^4, pressure gauge for fuel tank.
D^5, relief valve for air.
D^6, blow-off pipe for air.
D^7, connection for hand air-pump.
E, counter-shaft.
F, feed-water-pumps.
F^1, eccentric for mechanical pump.
F^2, lever of hand-pump.
F^3, plunger of hand-pump.
F^4, plunger of engine-pump.
H, fuel tank.
H^1, filler on tank.
H^2, air-pipe to tank.
H^3, supply pipe from tank.
J, main fuel cock.
J^1, fuel pipe to vaporiser.
J^2, burner heated vaporising coil.
J^3, vaporising coil also heated internally by blow-lamp.
J^4, gas pipe to regulating valve.
K, gas nozzle of burner.
K^1, handle regulating gas to burner.
L, air induction and mixing pipe of burner.
L^1, mixing chamber of burner.
L^2, burner tubes with jets.
M^1, casing around boiler.
N, water tank.
N^1, filler for tank.
N^2, dome of tank.
N^3, water supply pipe.
N^4, stop-cock between tank and pumps.
N^5, overflow pipe from tank.
P, water-delivery pipe to boiler.
P^1, branch pipe to safety valve.
P^2, delivery pipe to by-pass.
Q, safety valve.
Q^1, overflow to condenser.
R, by-pass back to water tank.
R^1, hand-lever regulating by-pass.
S, pressure relief valve.
S^1, pipes leading to and from relief valve.
V, steam pressure gauge.
V^1, pipe to ditto from engine.
V^2, flange on engine for pipe V^1.
W, condenser.
W^1, exhaust pipe to condenser.
W^2, pipe from condenser to water tank.
X, brake-drum on crank-shaft.

devices of any kind, and that it is chiefly in this respect that the Miesse cars differ from others in which steam generators of the flash type are employed. It might appear as though the control of the Miesse car was somewhat complicated owing to the large number of hand regulators which are provided. In practice, however, the speed of the car is for the most part regulated by varying the steam pressure, and this is done almost entirely by varying the quantity of water which is admitted to the generator, The heat of the burner must, of course, be regulated to a certain extent in accordance with the amount of power which is required. When the car is standing, the burner regulator is adjusted in such a way as to maintain as low a temperature as possible without any danger of extinguishing the flame. The proper position is largely determined by listening to the sound made by the burner, or by looking through the inspection hole, M^3, into the boiler casing. When running, the driver can ascertain whether the boiler tubes are insufficiently hot, or are over-heated, by noticing the rapidity with which the steam pressure rises in relationship to the quantity of water delivered to the generator. If very hot, the pressure will rise extremely quickly, and if not hot enough, the reverse will be the case. When unexpectedly brought to a standstill by traffic, the steam pressure is apt to rise rapidly, and it is for such occasions as these that the relief valve, S, on the steering pillar is provided, and that the safety valve, Q, is fitted. The steam pressure normally varies from about 150 lbs. up to 400 lbs., and the safety valve is usually set to blow off at about 500 lbs. per sq. in.

When a throttle valve is fitted, it is so arranged as to be held open normally by a spring, and it can only be closed by depressing a foot pedal. This valve is intended for use when wishing to slacken speed, or to stop momentarily, and is for the most part intended to obviate the necessity for moving the reversing lever, C, to zero and back again; it thus saves trouble and avoids unnecessary wear and tear on the cams.

The only part of the system which is automatic is the air system for maintaining a constant pressure on the fuel. The pressure is initially obtained by an ordinary tyre pump, which is connected to a nozzle provided for the purpose on the dash, and already mentioned in this article.

It is very important that the vaporiser coil should be thoroughly heated by the petrol blow-lamp before attempting to start the burner with its ordinary fuel. The operation of heating up takes something over five minutes to perform, but should not be hastened unduly because the burner is liable to smoke badly if the coil is insufficiently hot. With ordinary care, however, no smoking of the burner will occur, and troubles of carbonising in it will at the same time be avoided. When first turning on the paraffin, the cock should be very slightly opened, otherwise "surging" may result. The burner appears to work extremely well, and to give an enormous amount of heat; the simplicity of its construction is also a further feature strongly in its favour, and it is very quiet.

The hand pump for forcing water into the boiler is only intended to be used when starting the car, although by its judicious use the temperature of the boiler tubes can at any time be ascertained as already explained. The overflow from the by-pass, R, is now led through the condenser, and not direct to the water tank as indicated, for convenience, in the diagram; the water thus assists in cooling the condenser. The Miesse cars made at Wolverhampton are usually fitted with a double phaeton body, the rear seat of which is detachable. The cars are naturally somewhat heavy in comparison with petrol vehicles of similar size; but they appear to have ample power for all ordinary purposes. They are well and strongly built, and the bearing surfaces throughout are large.

* * *

It is stated that an air-ship designed to carry fifty passengers and 2,000 lbs. of freight is being constructed by the Aerial Navigation Company, a concern organised in Mexico City with a capital of £100,000. The first flight is, it is suggested, to be from Mexico to Washington.

The announcement made at the Vickers-Maxim meeting recently that the Company's investment in the Wolseley Tool and Motor Car Company, Limited, was of a profitable nature hardly came as a surprise to those who are acquainted with the business and the work turned out at the Adderley Park Works of the Wolseley Company. The popularity of this car is undoubtedly very great, and the number of prominent men who at the present moment are owners of the most recent type of this make is a good testimonial to their excellent qualities. Recently Sir Ernest Cassel has secured a 20-h.p. car, Baron Barreto a 20-h.p. double tonneau, and Col. H. N. B. Goode a 10-h.p. car. A 20-h.p. car with a specially designed covered in carriage body has also been supplied to Mr. A. F. Wallace for the purpose of an extended tour through Europe, whilst among those who have recently selected the Wolseley cars for use are Prince Louis of Battenberg, Lord Hindlip, Lord Selborne, and Sir Arthur Conan Doyle. The four special 50-h.p. racing cars which are now on the stocks are being built to the order of Lieut. Mansfield Cumming, Mr. Harvey Foster, of Sheffield, Mr. Leslie Porter, of Belfast, the fourth being to the order of a well-known member of the Automobile Club.

The use of motor cars is to be encouraged in the British Army, and special regulations have been drawn up to provide for cars owned privately by officers when the cars are being used for military duties. The following allowances under these circumstances have been notified:—

1. It has been decided that, as a tentative measure, allowances at the undermentioned rates may be granted to officers employing privately-owned motor cars on duty:

- (1) When the hiring of a cab or other conveyance would be admissible by the existing Allowance Regulations.
- (2) On the production of a certificate on Army Form O. 1771, signed by the officer putting forward the claim that, either
  - (a) The employment of the motor car has enabled him to carry out promptly duties that he would not otherwise have been able to perform; or
  - (b) The service for which the motor car was employed was urgent, and the use of the car enabled the service to be performed more quickly than by using any other available means of transport.

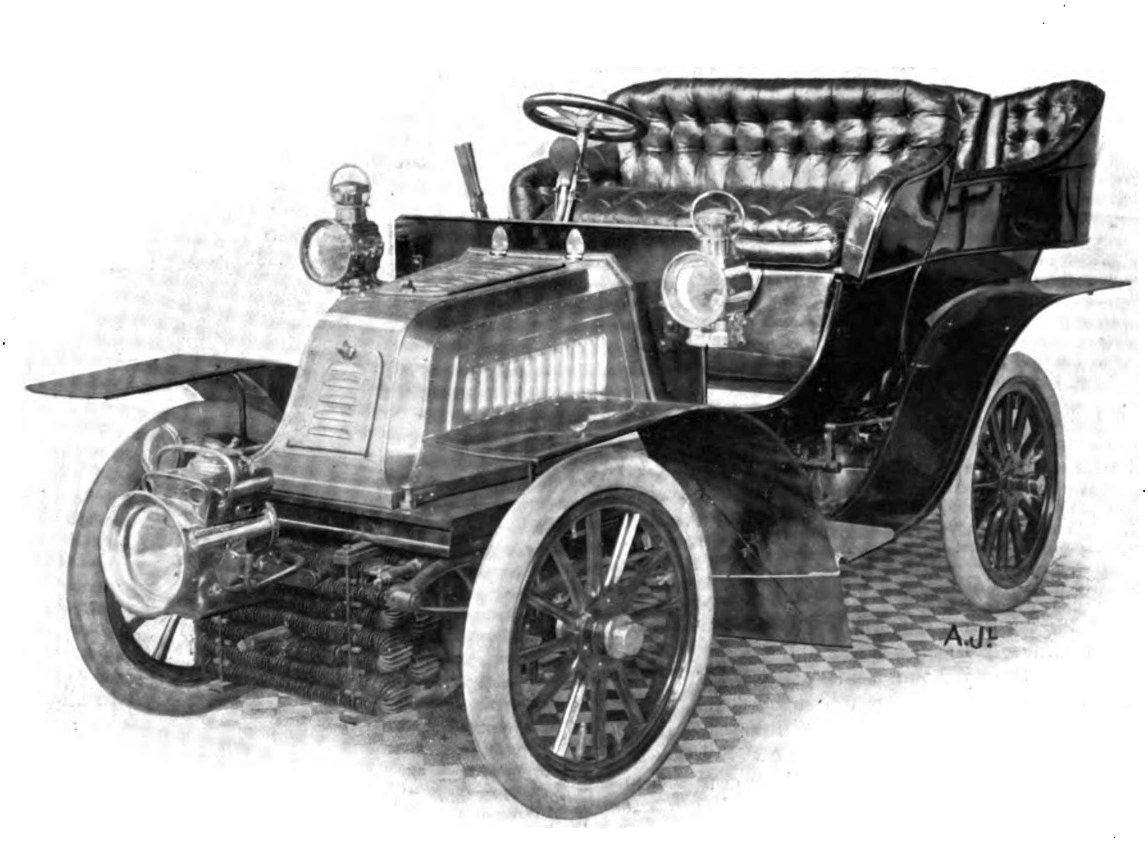
2. Should an officer when travelling on duty make use for his own convenience only of a privately-owned car, under circumstances not covered by Regulation 1 (1) and (2), he shall be entitled to claim allowance for mileage at the undermentioned rates, but the amounts so claimed must not exceed the expenses that would have been incurred had he employed the means of transport for which travelling expenses are allowed by Allowance Regulations.

3. The following rates have been approved:—

Rates.	Per car mile.
For a 4-seated motor vehicle	4*d.*
For a 3-seated motor vehicle	3*d.*
For a 2-seated motor vehicle	2*d.*
For a 1-seated motor vehicle	1*d.*
For a car having more than four seats (in addition to the rate allowable for a 4-seated car)	1*d.* per mile for each passenger carried in excess of four for whom travelling expenses are recoverable under Allowance Regulations.

THE ANNUAL AGRICULTURAL HALL EXHIBITION.—Part I.

THE eighth Annual Exhibition at Islington was opened on Saturday last, and remains open until the end of this week. Although the interest attached to it this year has necessarily been largely reduced, owing to the numerous Automobile Shows which have taken place recently, and although many of the striking novelties which were expected to be on view failed to put in an appearance, yet Mr. Cordingley is to be congratulated upon the success of his undertaking. At no previous Exhibition has the Agricultural Hall been so well filled as it is this year, and in spite of the fact that many leading motor car manufacturers are totally unrepresented there, yet the vehicles are in many cases somewhat too closely crowded together, and the dimensions of the automobile industry in relationship to the capacity of the hall is very forcibly emphasised.



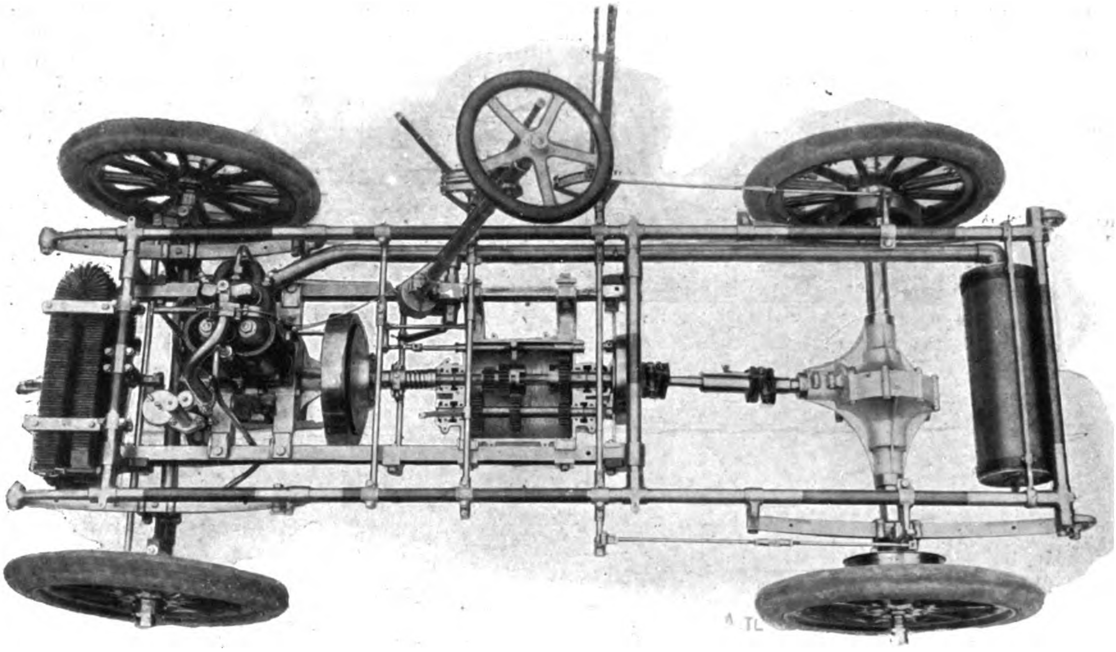
[Photograph by Argent Archer, Kensington.]

The 10-h.p. Horbick Car.

The main body of the building, as also the gallery, were completely filled, and in not a few cases it is noticeable that exhibitors have been allotted the same positions which they held last year. The minor hall contains a finer show of heavy steam lurries than we remember having seen on any similar previous occasion. As usual, the entrance arcade is fully occupied, for the most part by exhibits of accessories, lubricants, and motor clothing. A novel feature of the show, due to the joint enterprise of Mr. J. C. Hutton and of the Siddeley Autocar Company, is that the King Edward's Hall is fitted up as a comfortable lounge for the convenience of visitors, and to enable them to inspect in comfort the Panhard and Siddeley vehicles shown by these two firms, each car is arranged on a separate platform with free moving room all round.

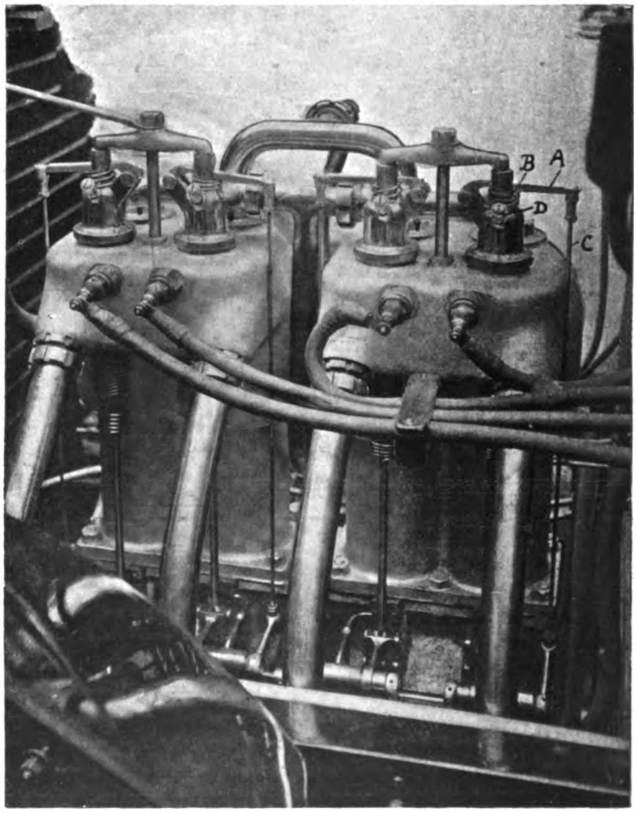
The majority of the exhibits have already been seen before by those who have attended the recent Exhibitions at the Crystal Palace, at Earl's Court, and in Paris, but the rapid progress which is being made in the industry is evidenced by not a few improvements which are to be noticed on the cars and chassis of even those makers who were represented at the earlier shows. Several new cars are also on view for the first time, and these will receive our special attention. As has been said, the majority of vehicles and of other important exhibits have already been dealt with fully in our columns, either in connection with previous Exhibitions or in separate special articles recently, and we do not therefore propose to encroach upon our space by any unnecessary repetition. We would, however, draw the attention of those requiring full descriptions of any of the well known cars to the second page of this journal, where they will find a reference list of those cars and systems which have received specially complete treatment in our columns during the past year.

We are particularly glad to notice that several new



The 8-h.p. Horbick Chassis.

English makers are taking up the construction of automobiles, and that there is a decided tendency for some of those who have had a thorough engineering experience to turn their attention to this work, and to introduce cars which, both in design and in workmanship are in accordance with the best traditions of British trade. Although we shall make brief mention of these, and of other new cars in this report of the show, yet we hope to deal very fully with the more interesting of them in separate subsequent articles of a similar character to those which have been a special feature of this journal. The general tendency which is in evidence is towards lightness, simplicity, and strength; and throughout the Exhibition it is obvious that an enormous amount of attention is now being given to the carriage work of the cars, the personal comfort and convenience of the driver and the passengers being carefully studied. With regard to the new features which have attracted special attention this season, it appears probable that stamped steel frames will be adopted to a considerable extent by English makers, although those built up of wood and steel, or of tubes, are by no means out of favour. The question of mechanically-operated inlet valves is one upon which considerable divergence of opinion still exists, but the general consensus of opinion appears to be against them, even if the popular demand for them renders their adoption advisable. The Germain Company have attempted to secure any advantages which may be possessed by them, and to also retain the benefits of atmospheric inlet valves, but although we admire the enterprise of this excellent firm, yet we fail to see that they can hope to succeed completely in this endeavour. The inlet valves are mounted above the cylinders, as shown in one of our illustrations, and are provided with light springs, so that they can work in the ordinary way. Levers are pivoted to the induction-pipe-fitting holding them in

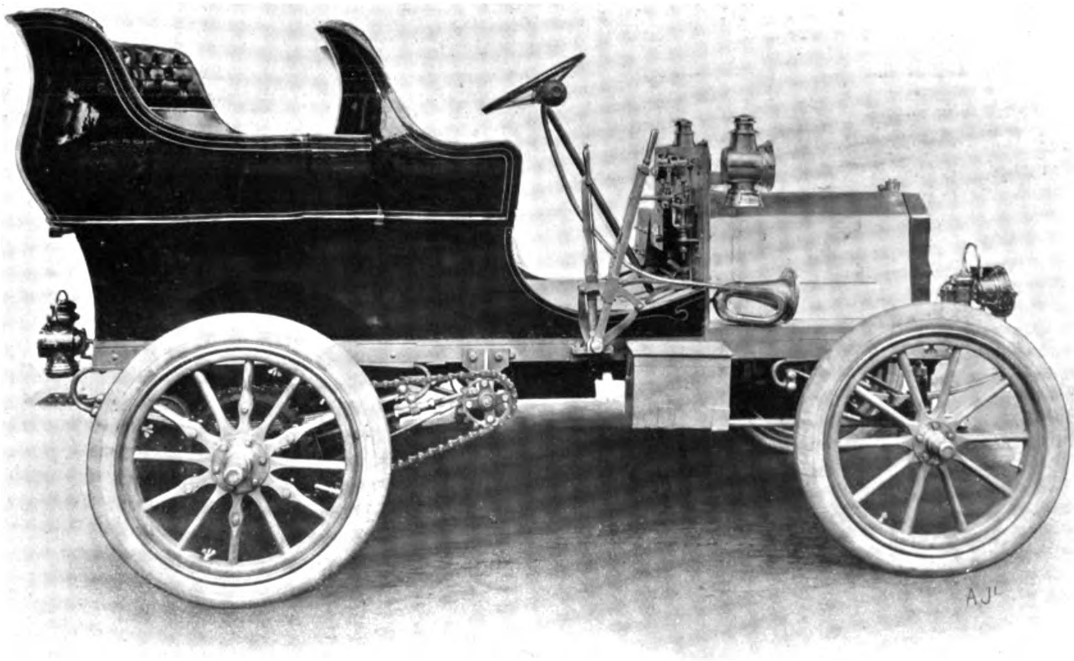


15-h.p. Germain Engine, showing Combined Mechanical and Atmospheric Inlet Valves.

A, Pivoted lever engaging valve rod.
B, Spring supporting lever, **A**.
C, Removable cam-operated rod, hooked over lever, **A**.
D, Valve for introducing paraffin to induction valve.

place, and these levers, which are normally held out of engagement with the valve-spindle by a spring, are so shaped that cam-operated rods (C) can be hooked over their ends when it is desired to operate the valves mechanically. The reason why we are inclined to doubt the value of this arrangement is that the springs of the valves must be sufficiently weak for the atmospheric action, and that one of the chief advantages of a mechanically operated valve is that a very strong spring can be used with them. On the other hand, however, they probably achieve the one advantage which is claimed for them—that when the engine is running slowly they allow it to do so more quietly. At any rate, they ensure the valve opening fully at such times.

Honeycomb coolers can hardly be said to have caught on in England, but a variety of fan-cooled radiators are being fitted, and the "Loyal" type of tube is decidedly a favourite. Neatness *versus* cost of construction practically sums up the position, and it appears as though an intermediate type between the old form of radiator and the honeycomb pattern is favoured by the majority of makers. We are glad to notice the increased adoption of dust-proof casings beneath the driving mechanism, for although in petrol cars the engine and the gear-box have for some time had their moving parts enclosed in their own casings, yet this additional protection for those portions of the mechanism which were still exposed is a step in the right direction, and does not necessarily interfere with accessibility, as was at one time anticipated. The new method adopted by the Decauville Company of actually supporting the engine and the gear-box by a sheet of metal connecting them with the main frame, and of thus utilising a dustproof under-casing as a continuous support for these parts has much to commend it, particularly if the cost of manufacture can be kept within reasonable limits. In this machine, it will be remembered that the base of the crank chamber, and the base of the gear-box are formed by a single casting. The steel sheet is bolted to this casting, and is securely fixed on all sides to the pressed steel frame.

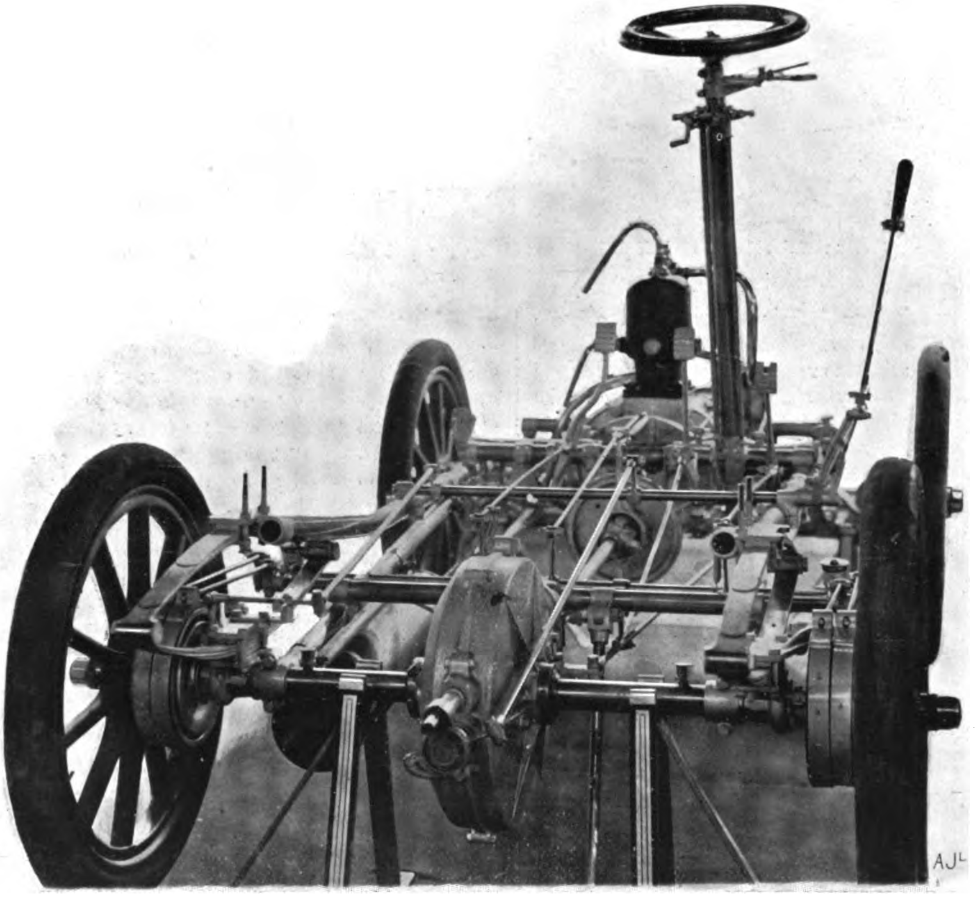


The 12-h.p. Canterbury Car.

Amongst the new petrol cars of English manufacture we noticed those of Horsfall and Bickham, of Manchester; Mr. Frank Morris, of Kings Lynn; Mr. George Hurst, of Holloway; Messrs. Suffield and Brown, of Willesden; the Ridley Autocar Company, of Coventry; and the Canterbury Motor Car Company, besides the "Soames" Car, which we describe elsewhere this week.

Messrs. Horsfall and Bickham's "Horbick" car is being fitted with a 10-h.p. twin-cylinder engine, and is shown in one of our illustrations. An 8-h.p. chassis, of which we give a plan view, is also shown. These machines are extremely well built and are finished on engineering lines, the speed-levers being characteristic of their construction, in that they follow locomotive and machine tool practice. The main frame is tubular, and the underframe is constructed of channel steel. The channels are planed on all three sides, and carry the 2-cylinder engine and the gear-box. In the 10-h.p. cars a spring cushion is introduced in the small part of the clutch, and an expanding type of clutch is used. The bearings of the gear-box are double, and are "ring" lubricated, chains, however, being substituted for the ordinary rings. A direct drive-through is obtained on the top speed, and the lay-shaft, with its gear wheels, is machined out of a solid bar of steel. The foot-operated band brake behind the gear-box is of the metal-to-metal internal form, and the side-brakes are of the expanding type. A separate lever is used for the reverse, and three forward speeds are provided. A very neat telescopic coupling is introduced on the universally-jointed shaft leading from the gear-box to the live-rear-axle. The engine has a governor, which acts upon the throttle valve, and the normal speed of the engine is varied from an ingenious little lever on the steering pillar through a Bowden wire.

A similar lever on the other side of the pillar times the ignition. The levers project from small friction discs fitting against flat faces and pressed up against them by an adjustable nut. The wires leading to the ignition plugs are connected to spark gaps enclosed in a glass fronted case on the dash, the current sparking across them on its way to the cylinders. The fittings on these vehicles are very complete, and are quite in keeping with the high-class quality of the workmanship throughout.



[Photograph by Argent Archer, Kensington.]

6-h.p. "Swift" chassis, showing New Method of Suspension and Double Side Brakes.

Mr. Frank Morris shows amongst his other exhibits a neatly-finished 10-h.p. car of his own construction. It has a channel frame, and an underframe of similar form carrying the twin-cylinder engine and the gear-box. The rear portion of the body is hinged at the back so that it can be tipped up in order to get at the gearing. The main clutch is of the cone type, and the male portion slides upon the first-motion-shaft and drives it by three feather keys. The second-motion-shaft is arranged above the first-motion-shaft in the gear-box, and the differential gear carries two bevel wheels which can alternately be brought into mesh with the wheel on the rear end of the second-motion-shaft by sliding the differential sideways. Internal brakes are fitted inside the sprockets on the countershaft, and expanding brakes of a similar kind are fitted to the hubs of the rear wheels. The commutator is mounted on the dash and is driven by bevel-gearing, which is entirely enclosed. A carbon contact is used in the commutator. The bearings throughout the gearing are of the "ring" lubricated pattern. The car appears to be well and strongly built.

The "Hurst" Cars which are made either with a 12-h.p. twin-cylinder engine or a 24-h.p. 4-cylinder engine have a very taking appearance, the larger vehicle in particular being very comfortably fitted and having convenient storage accommodation in the way of cupboards. These 24-h.p. cars are either chain-driven or have live axles, according to the wishes of customers, the one shown being of the latter form. The cylinders have a bore of 4½ inches, and a stroke of 5 inches, and the normal speed is 800 revolutions per minute.

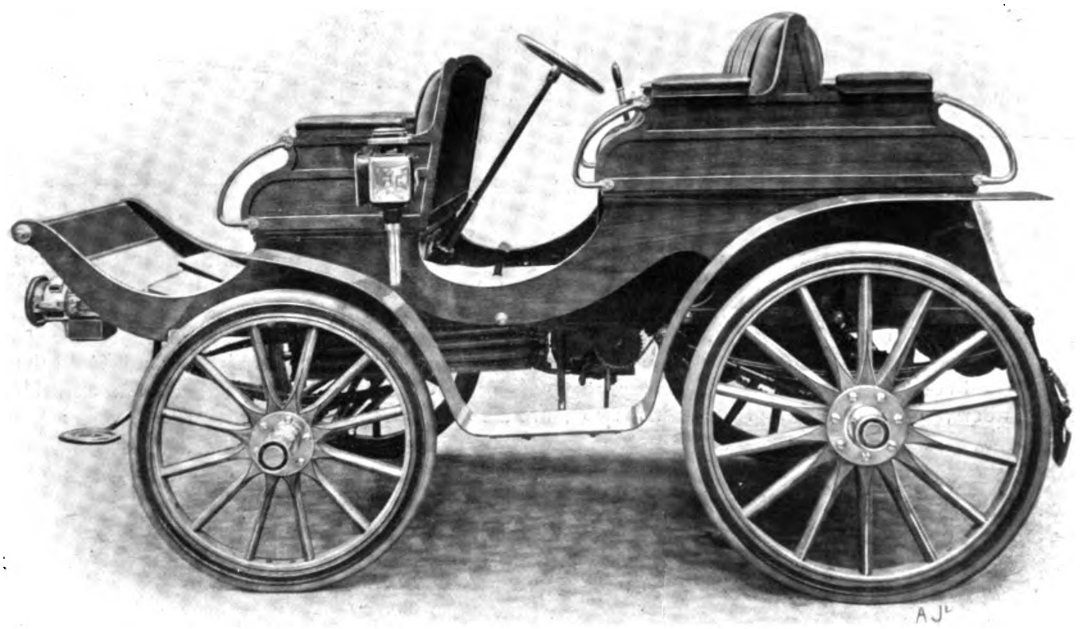
Messrs. Suffield and Brown, who are making petrol, steam and electric cars, showed a steam vehicle with a 3-cylinder engine having one high-pressure cylinder and two low-pressure. The power is taken by a Renold silent chain to a differential countershaft, and from there by side-chains to the rear wheels. A fire-tube boiler supplies the steam, and the car is of a substantial character. The Company's standard petrol car has a 2-cylinder horizontal engine, the cylinders having a bore of 5 inches and a stroke of 8 inches. A variety of special parts supplied by them, including boiler shells, roller bearings, and "Sine" (Joel) electric motors are on the stall.

The Ridley 4½ h.p. Voiturette has a tubular frame, and is fitted with a 4½ h.p. Buchet water-cooled motor. The two-speed gear is provided by bevel gears driving the live-rear axle, and, as in the Swift Voiturette, the differential gear is replaced by free-wheel clutches. The bevel wheels employed have "skew" teeth, because the axis of those on the driving shaft is above the axis of the live axle.

The Canterbury Motor Company's 12-h.p. car is fitted with one of the new 2-cylinder Aster engines. It has a wood and flitch frame and an angle underframe for supporting the engine and gearing. Ball-bearings are employed in the gear-box, and the main clutch is of the internal cone type. The differential gear on the countershaft lies outside the gear-box, and the sprockets on the end of the countershaft are so constructed that they can be changed without removing the hubs of the wheels. The sprockets are practically rings with four arms, and they register over the fixed hub and are held in place by four bolts.

A single lever is used for the forward speeds and the reverse. The car is shown in one of our illustrations, and it will be noticed that the body is of somewhat unusual form, it is built of wood throughout by the Wolverhampton Motor Body Company. A honeycomb radiator is used, and a fan is employed for drawing the air through it. The side-brakes are operated by the foot-pedal, and the countershaft brake by the hand-lever, these two controls being arranged in the reverse manner to that usually met with—a practice which we have noticed on one or two other vehicles recently.

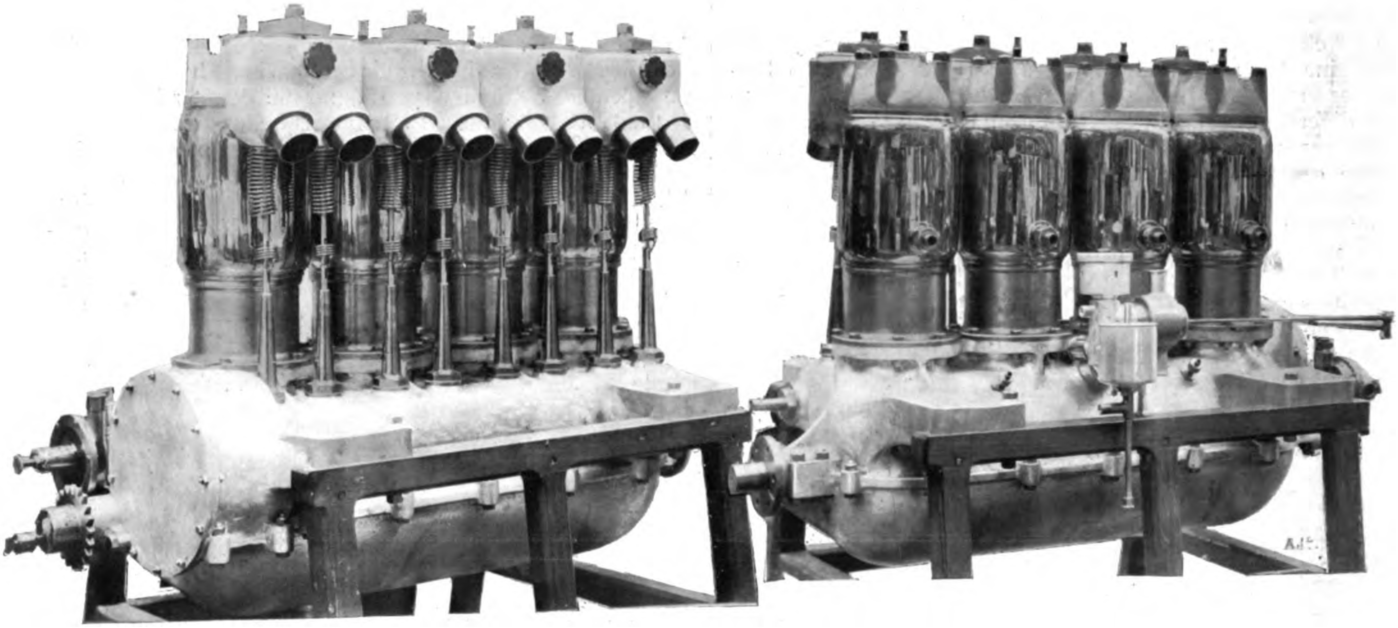
This arrangement of the brakes is found on the 12-h.p. Phœnix car, which is of the live-axle type and has a two-cylinder motor. The two cylinders are cast separately, and the circulating water is taken through the two jackets in parallel. The change-speed-gear provides three forward speeds and a reverse, but does not give a direct through-drive on the top gear. An internal cone clutch is employed, and the car appears to be well made.



A 12-h.p. Arroll-Johnston Car.

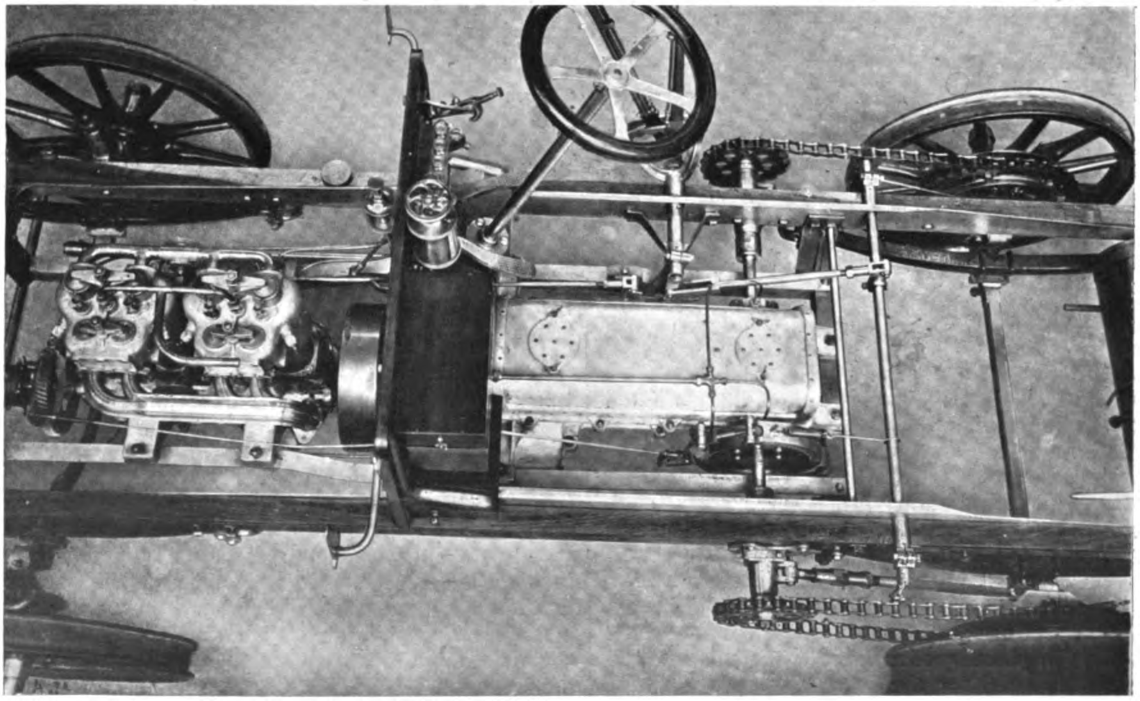
British made petrol vehicles, which are already more or less well known to our readers, are shown by a large number of makers. The Ariel and the Swift vehicles are shown on one stall, the former remaining unchanged since they were on view at the Crystal Palace, but an improved form of Swift Voiturette is shown. We reproduce a photograph of the chassis, and it will be noticed that the mainframe is now suspended above the rear axle on full elliptic springs as well as above the front axle. A 6-h.p. high-speed engine is employed, and the change-speed-gear and reverse is the same as previously described by us. Tubular distance rods connect the back axle with the frame, and two sets of band-brakes, acting on the hubs of the rear wheels, are provided. Each pair of brakes is controlled by a separate foot-pedal, and artillery wheels are used.

Fine exhibits are made by the Velox Company, the New Orleans Motor Company, F. F. Wellington (with the



The 40-h.p. Germain Engine, which has Steel Cylinders and Mechanical Inlet Valves.

Brooke Cars), the Hozier Company, the Maudslay Motor Company, James and Browne, the Beaufort Motor Company, and Weller Brothers. The Motor Car Syndicate's Arroll-Johnston 12-h.p. vehicles (one of which is shown in an accompanying illustration) attracts a good deal of attention owing to the special construction adopted. The engine has horizontal cylinders, each of which contains two pistons. It is water-cooled, and the radiator consists of a large number of Clarkson tubes arranged horizontally beneath the front of the car. The design is ingenious, and will be referred to again by us. The Star Engineering Company and Messrs. Pritchett's and Gold have similar exhibits to those at the Crystal Palace, and Hermes cars are also shown.



The 20-h.p. "Kensington" Chassis.

Stirling's Motor Carriages, Limited, show one of their petrol 'buses which have already become familiar in London, and a large stall of M.M.C. cars is again in evidence. Their latest 20-h.p. chassis fitted with the Eisemann magneto ignition and some of the new forms of body which they are introducing, are attractive features of the stall. The Rex Motor Manufacturing Company show two of their popular little machines, their chief novelty being the single cylinder engine, which is fitted with a governor operating the throttle valve.

Rawlings Brothers, of South Kensington, represented the Belsize cars and also their Kensington vehicles. A 15-h.p. chassis of the latter make is illustrated by us, and it will be seen that it follows Panhard lines very closely. A 9-h.p. complete car is also on the stall.

Of well-known foreign petrol vehicles a large number are as usual on view. The stall of the British Automobile Commercial Syndicate is particularly noticeable, owing to the amount of floral decoration which adorns it; a Panhard and a Clement chassis, in addition to complete cars of those makes, are on view there. The British Germain Company show as much recent progress as any other concern in the Show, their 15 h.p. engine has already been referred to above, and the car to which it is fixed is a fine piece of work. One of the new 40 h.p. engines built for a racing car for the Paris-Madrid race, is shown from both sides in our illustrations. It has steel cylinders and mechanically-operated inlet valves alongside the exhaust valves; it attracts no little attention from the visitors. A well-built petrol lurry, built by the Company, is on view near the entrance to the Minor Hall. It is capable of carrying loads of about five tons, and is fitted with a change-speed-gear in which the spur-wheels are at all times in mesh with one another. The desired speed is brought into play by a jaw-clutch. The differential countershaft does not carry the sprocket wheels direct upon its ends, but a reduce speed gear is introduced between it and the sprockets from which the chains pass to the rear wheels; these spur-wheels are entirely enclosed, and are so arranged that their existence could easily be overlooked unless they were pointed out to one. This is one of the few petrol-driven heavy vehicles in the Show.

(To be continued.)

CORRESPONDENCE.

IGNITION SYSTEMS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With regard to your recent illustration and description (a very interesting article indeed) of three new synchronising ignition systems, whilst fully appreciating the good points of the third one, that of Mr. Blake, and without wishing to deprive him of any credit, may I venture to remind you that the Holden bicycle, which you illustrated and described about a year ago in its recent form, has been fitted with this system from the commencement, namely, about 1897, with the exception that the contact maker, instead of being fitted on the cam-shaft, as in the Blake, is fitted on the crank-shaft, and in some respects this latter plan is, I think, to be preferred.

Also I believe you will remember giving particulars and sketch of the "Bolide" distributor machine in 1899, and this was arranged exactly as in Mr. Blake's, namely, with contact maker and distributor on same shaft and close together, but was shown for a 2-cylinder engine, although, of course, easily arranged for four cylinders.

It seems to me, therefore, that the third system referred to is hardly to be called a new one, but rather an appreciation of the advantages obtained by it, and its placing on the market by a good firm such as Mr. Blake's. I trust it may prove very successful.

Apologising for troubling you, yours faithfully,

Brixton Hill, March 23. HARRY PARSONS.

TRIALS AND RACING.

Paris-Monte Carlo Heavy Vehicle Trial.—Although five vehicles were duly weighed and went through the consumption tests last Saturday, the 21st instant, in connection with this event, organised by *La France Automobile*, only three competitors were actually timed away when the start was made last Sunday. For the preliminary test the vehicles were required to run round the Daumesnil Lake road—which has a length of 2,250 metres—and their consumption of fuel was after a time measured. The five vehicles taking part in these preliminary tests were as follows:—

Bardon wagon, weight laden, 2,457 kilogs., distance 43 times round the Lake (= 96·750 kiloms.) in 5 hours 4 mins. Consumption, 5·46 kilogs. petrol.

Peugeot wagon, weight laden, 4,875 kilogs., 43 times round the Lake in 5 hours 5 mins. Consumption, 19·915 kilogs.

Ader car, weight, 1,100 kilogs., 60 turns. Consumption, 26·110 kilogs.

Serpollet omnibus, weight, 3,466 kilogs., 40 turns. Consumption, 61·680 kilogs.

De Dietrich omnibus, weight, 2,500 kilogs., 30 turns. Consumption, 22·400 kilogs.

The vehicles which started on Sunday were the No. 4, an 8-h.p. Bardon, No. 2, a Serpollet omnibus with 6 passengers and ballast, and No. 1, a De Dietrich omnibus with 5 passengers and ballast. The start was made in splendid weather, and the date of arrival at Nice is fixed for to-day (Saturday).

COMPETITION OF SILENCERS.—On the 14th inst., page 283, we gave particulars of this competition. The results are now announced as follows:—1st Ossant apparatus; 2nd, De Reiz; 3rd, Arnaud; 4th, Linzeler (Ravel system).

THE awards in the motor car lamp competition, organised by the Rhone Automobile Club are as follows:—*Acetylene generators* (1), Zanardini. *Projectors*, Cat. 1 (under 100 francs), (1) Boas Rodriguez; Cat. 2 (100 to 200 francs), (1) Monin; Cat. 3 (over 200 francs), (1) Zanardini. *Petrol lamps* (1) Ouvriers lanterniers.

THE Belgian Circuit des Ardennes may possibly be advanced from August to June.

THE Massachusetts Automobile Club propose holding a race meeting in May, and the Syracuse Club in September.

THE proposed speed trials and exhibition at Brighton in May next are not to be proceeded with by the Automobile Club.

A TELEGRAM from Florida credits Winton with having covered the kilometre on one of his new cars in 26 secs., equal to 86·03 miles per hour.

SPEED Trials are to be permitted on the Promenade des Anglais, Nice, once a month. The Mayor of Nice is to be congratulated upon having granted this privilege.

MR. CHARLES JARROTT has entered for the Speed Section of the Nice week, and Mr. Alfred Harmsworth's name is down with a Mercedes car. One of the new Mors timing apparatus has been secured by the organisers for use in the mile and kilometre events.

THE course, as officially recognised for the Tourist Section of the Paris-Madrid Race, is Paris, Pougues, Royat, viaduc de Gabarit, Murat, Vic-sur-Cere, Rocamadour, Gahors, Agen, Biarritz, Saint-Sébastien, Zaraus, Bilbao, Portugalette, Vittoria, Miranda del Ebro, Burgos, Venta de Banos, Valladolid, Salamanque, Avila Madrid. In the Racing Section a prize of 2,000 francs is offered by the French Agricultural Society for the first car using alcohol as a fuel which gets through.

The next Quarterly 100 Miles Trial of the A. C. G. B. I. will take place on April 24th next.

"Circummote" is the latest word invented by the *Daily Telegraph* for encircling the globe by automobile.

Two more British made automobiles, one a high-powered car and the other a light type of vehicle, are in hand for the Prince of Wales.

Mr. Radford Cooke, who has been so long intimately associated with the Automobile Club as Chief Clerk, has now been appointed to the position of Assistant Secretary to the Club.

Two motor launches are to be provided by the London County Council at a cost of £400, one for use on the lake in Battersea Park and the other in Victoria Park. They are to be available for trips on the water at a small charge.

Cyclists on road record breaking attempts must not for the future be piloted by motors. Such is the decision of the Road Records Association; and, moreover, riders who act as observers in unpaced road rides will not be permitted to be mounted on motors of any kind.

The question to be decided by means of a postal vote of the members of the C.T.C. is whether automobilists as such and tourists in general shall be entitled to join the Club, and participate in the privileges in the same way as cyclists and motor cyclists. The latter were admitted to the full benefits of the Club last year.

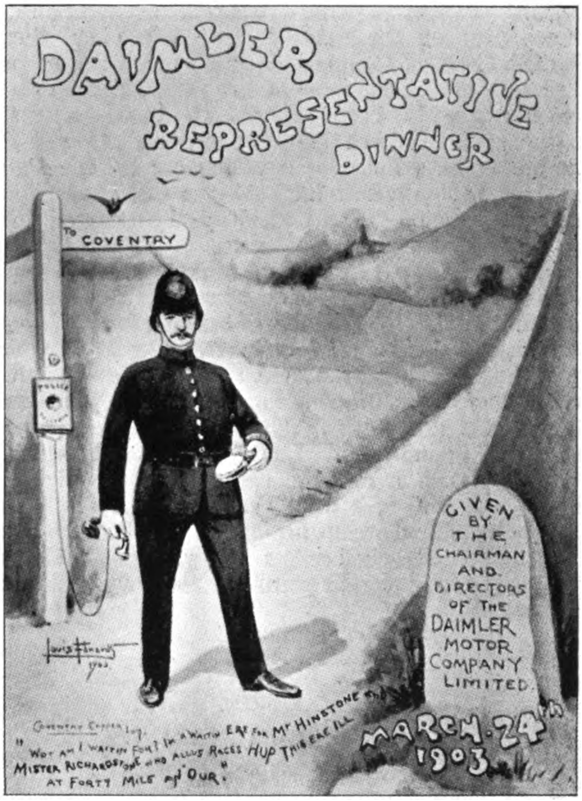
In Earl Dudley, Lord Lieutenant of Ireland, automobilists have a good friend. Last week, upon his arrival at Holyhead from Dublin, he continued his journey to London by motor car, accompanied by his brothers, the Hon. Robert and the Hon. Cyril Ward. Two days were occupied in the trip, Earl Dudley arriving in town on Saturday evening last.

In 1896, the Hon. C. S. Rolls was stopped by the police on his automobile for not carrying a red flag in front of his car. Since then Mr. Rolls has not been interviewed by the custodians of the peace until March 8th at Ifield. Mr. Rolls' speed upon this occasion was stated by the police at Horsham last week to be 30 miles an hour. Result, a fine of £2 and 6*s.* costs.

The Central Highway Commission, which Mr. Rees Jeffreys has proposed to establish as a central authority for the control of our high roads, is to be modelled, he tells us, in some respects on the Lunacy Commissioners. There is a delicate suggestiveness about this proposal, which leads us to suspect Mr. Rees Jeffreys of a particularly subtle vein of humour.

Bishop Jacob, of Newcastle-on-Tyne, is to have a motor car for use in his new diocese of St. Albans. This is to be presented to him by the clergy and laity of Newcastle, where Bishop Jacob has been in active work for the past seven years. The Duke of Northumberland and Earl Grey are co-operating in this presentation, and Bishop Jacob has already signified his pleasure at the prospect which its acquisition opens out.

There is an old saying that "good wine needs no bush." This in the main is true, as the holder of a good vintage need have no fear but that with age his property will steadily increase in value, while in time its quality must assuredly assert itself and command its price. In their present stage of development the reverse applies to motor cars, as the best car of this year may be many degrees from being the best car of five years hence, if the same pattern be maintained. Therefore is it of vital importance that, to build up and maintain a successful automobile manufacturing business a number of good commercial men should be secured as selling agents of the cars as they become available for the public, so that obsolete patterns in stock may be unknown, and steady progress made year by year by introducing and disposing of each year's improved patterns with sufficient rapidity to make room for the new stock for the next season. Appreciating this fact, the directors of the Daimler Company on Tuesday night invited their chief agents throughout the country to join them in social intercourse at a dinner at the Trocadero, in order that they might meet each other as friends for the purpose of cementing the business relationship already existing between them. A pleasant gathering resulted, over which—in the unavoidable absence of Sir Edward Jenkinson, the Chairman of the Company—Captain Longridge presided. Amongst those present were Messrs. E. M. C. Instone, Percy Richardson, E. P. Harris, Basil Joy, E. A. Rosenheim (Road Carrying Company), W. M. Hodges, W. Glass (Firefly Motor Company), E. W. Lancaster, G. Foster Pedley, L. Edwards, H. Hayter (Hull), Appleton (Bristol Motor Company), Hamburger, Parker Thomas (South Wales Motor Company), A.


DAIMLER
REPRESENTATIVE
DINNER
TO COVENTRY
GIVEN BY THE CHAIRMAN AND DIRECTORS OF THE DAIMLER MOTOR COMPANY LIMITED
MARCH 24th 1903
Louis Ftheus 1903
Coventry Copper log.
"Wot am I waitin for? I'm a waitin ere for Mr Hinstone and Mister Richardstone who allus races hup this ere ill at forty mile an' our."

Farnell (Bradford), and R. J. Mecredy. An extremely enjoyable evening was passed, and after the loyal toast, Mr. Instone proposed the toast of "The Guests," his suggestion of the possibility of the meeting being an annual affair being very enthusiastically received. Mr. Farnell, Mr. Parker Thomas, and Mr. Rosenheim responded, and in reply to Mr. Richardson's toast of "The Press," Mr. Mecredy, who was in his happiest vein, related some delightfully humorous tales in place of the regulation speech. Speaking of the Gordon-Bennett Cup, he mentioned that he had been over every inch of the road several times, and had carefully measured up the various stretches of dead straight road over the whole course, wherever these amounted to a mile continuously. He estimated that there would be at least 221 miles of dead straight road from the start to the finish of the race. We reproduce the humorous frontispiece to the menu, specially designed by Mr. Louis Edwards for the occasion.

THE agitation of the Roads Improvement Association in favour of the provision of more and better roads has resulted in the appointment, by the President of the Local Government Board, of a Departmental Committee to inquire into the general condition and sufficiency of the roads of England and Wales, and to report whether any, and if so, what amendment of the law relating to these matters or its administration is desirable in view of the various purposes for which the roads now are, or shortly may be, utilised, and particularly whether any change of the authorities who have control over the roads or of their powers is required. The Hon. A. Stanley, M.P., and the Hon. J. Scott Montagu are amongst those appointed on the Committee. But we certainly think official representatives of the Automobile Club and the Roads Improvement Association might, and in fact should, have been included.

LAST week we published a photograph of the 8-cylinder C.G.V. car which had in Paris demonstrated its capabilities of running exceptionally quietly through all the speeds of the engine. By the enterprise of Messrs. Evart Hall, Limited, who are the British agents for this make of vehicle, the car was brought over from Paris on Monday, and was to be seen at their depôt at 38, Long Acre, on Tuesday and Wednesday, when a very large number of visitors attended to see this remarkable machine. A run on it through the thick of the West End traffic, and a spin round the Park, gave convincing evidence that the reports of its even running were in no way exaggerated. This vehicle will be run in the Paris-Madrid Race, and before the present issue of the Journal is in the hands of our readers will be already back in France and on its way to Nice to take part in the speed events during the coming Nice week.

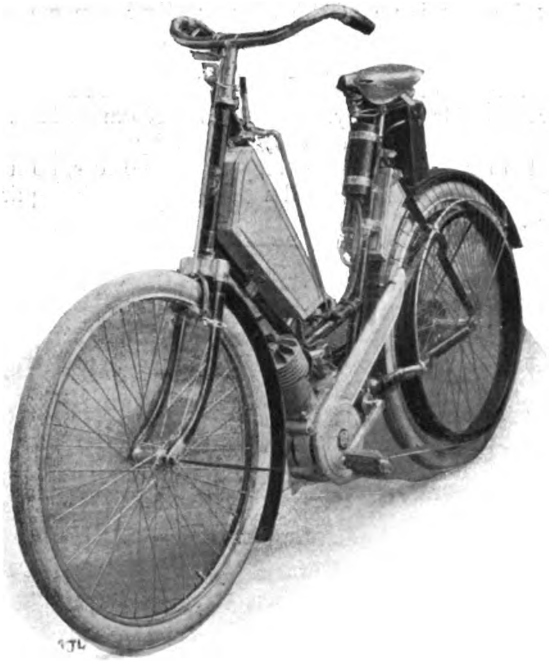
SOUTHPORT, it has been decided, is to have its speed trials on the front. They will be, as stated last week, under the direction of the Liverpool Self-Propelled Traffic Association, and the date fixed is July 24th and 25th. The Southport Corporation, who are actively co-operating to ensure a big and successful meeting, will take down lampposts and the drinking fountain, and go to considerable expense in making up the promenade to ensure the greatest speeds being attained. In addition, automobilists are to be the guests of the Corporation, quite a round of festivities being arranged in their honour.

IN the next issue of the *World's Work* a poem on the delights of motoring by Mr. Henley, entitled "The Song of Speed," will be published. The poem will be accompanied by a critical article by Mr. William Archer and a portrait of Mr. Henley. Mr. Henry Norman, M.P., continues his article on automobilism by giving detailed calculations of the cost of keeping a motor car, both a car which requires a driver, and a small car which requires no driver.

AMONGST the fixtures of the Aero Club announced for the coming season are balloon ascents from the Crystal Palace on April 25th, May 9th, 28th, June 25th, July 4th, 16th and 25th, and from the Ranelagh Club, May 23rd and June 10th. On June 6th an evening meeting and a night ascent at about 9 p.m. in addition will be held at the Ranelagh Club. Several balloon hunts are also to be organised, for which prizes will be offered. The Anniversary Dinner of the Club will be held on November 25th.

AT the Aeronautical Institute last week Dr. Barton announced that the Institute is organising an exhibition of balloons and aerial machines to be opened at the Alexandra Palace in July next. The exhibition is to be of a comprehensive nature, with different sections for balloons, airships, parachutes, kites, models, light motors, submarine boats, and other apparatus. Ascents from the Palace grounds will be made during the exhibition, and the trials of the new airship now in course of construction for the War Office will also take place.

IN a paper, read recently before the Western Section of the Scottish Automobile Club, Mr. W. Weir made a distinctly useful contribution to the literature of automobilism. He dealt mainly with its commercial aspects, and he went over most of the ground in a distinctly original way, and amongst a variety of other topics of particular interest to automobilists, gave data of the relative cost of self-propelled and horse-propelled traction as applied to cars. From figures compiled from reliable sources, Mr. Weir finds that in a yearly service the cost of running a horse-drawn cab works out at 5·936 pence per mile run—that of an automobile cab being as low as 3·825. If these figures are correct they show that automobile traction, even for the relatively expensive cab, will enable a considerable degree of saving to be effected. The most suggestive part in Mr. Weir's paper, however, was concerned with the position and prospects of the English automobile industry. At present, according to him, English builders turn out about 2,500 cars annually, while 3,500 more are imported from abroad. Of course, the demand for cars is a rapidly growing one, but even without any alteration in the demand these figures show that, if the output of English makers were considerably more than doubled at the present moment, they would be able to command a purchaser for every car turned out. In spite of this, however, few English makers are working at a profit, and this Mr. Weir doubtless quite correctly attributes to want of specialisation. In one respect we are glad to find the author of the paper considers this country to be a long way in advance of the Continent, and that is in our automobile journals. Our acknowledgments to Mr. Weir for this testimonial.



A Lady's Motor Bicycle, built by the Booth Motor Company, of Putney.

The photographs of the very neat lady's motor bicycle which appears on this page have been sent us by Mr. F. Hulbert, of Putney. It has been designed and built specially for him by the Booth Motor Company, of Grand Parade, Putney, Mrs. Hulbert being shown riding the machine in one picture. The engine, which is bolted to the bottom tube, is a 2-h.p. Minerva with mechanically operated inlet valves. The petrol tank is placed just above the engine, and has sufficient capacity for 120 miles. The coil and battery are placed under the saddle. The dress-guard is very neatly arranged to protect from any mishap with the belt. As Mrs. Hulbert is a constant rider on this machine, we are not surprised to learn that she is creating quite a sensation in the district during her runs.

The Chairman of the Manchester Automobile Club, at their annual dinner last week, said he could not extend much sympathy to the dog which rushed out at motor cars. What a dog can do in its efforts to obtain sympathy was exemplified on the Canterbury road a few days ago when Mr. Thomas Sylvester, a dentist, of Ashford, Kent, was killed by being thrown from his motor cycle through a dog which ran across his path. Mrs. Sylvester who was in a trailer behind fortunately escaped with a severe shaking.

In connection with the Naval and Military River Club, so delightfully situated at Maidenhead Bridge, and which is to be opened early in May, a motor car service is to be inaugurated during the season. The cars will run every Friday, Saturday, and Sunday throughout the summer, starting from the Savoy and Claridge's Hotels, calling at the Naval and Military Club, Piccadilly, and occupying about two hours in running down to the Maidenhead Bridge Club premises, a fare of 5*s.* each way being charged. The Duke of Cambridge is announced as President of the Club, the secretaries being Captains John Kennedy and C. C. Mahony.

At the first annual banquet of the Society of Motor Manufacturers and Traders, which takes place next Friday, April 3rd, the Hon. John Scott Montagu, M.P., will be the guest of the evening, and a goodly number of the leading representatives of the trade will, it is expected, be present. In the Society's March circular to hand it is notified that the following members have been elected to the Society: Andrew Anderson, Collier Twin Tyre Co., Ltd., Langdon-Davies Motor Co., Ltd., Lea and Francis, Ltd., Marshall and Co., Maudslay Motor Co., Pick Motor Co., Ltd., C. S. Rolls and Co., Ryknield Engine Co., Ltd., Standard Motor Co., Ltd., Star Engineering Co, and Weller Bros., Ltd.

Some details are to hand of the six petrol motors which are at present being employed by the North-Eastern Railway Company on their Hartlepool line. These machines (which were built by the Automobile Components, Limited, of Islington) are of the 4-cylinder type, with a bore of 170 mm. and a stroke of 260 mm., the height being 4 feet, and length 4 feet 10 inches. They work on the ordinary four-stroke cycle, and develop 100-h.p. at 450 revolutions per minute. The speed can be varied from 200 to 600 revolutions per minute. A Longuemare carburettor is employed. By way of further test for this work, two 80-h.p. Wolseley horizontal 4-cylinder petrol engines, developing about 95 brake horse power, are on order for use in the Company's automotor railway coaches. As the Wolseley engines are of the hori-

Mrs. Hulbert riding her Motor Bicycle.

zontal type, their performance, as contrasted with those already in use, which are of the vertical type, will be watched with considerable interest.

In New York the chauffeur-commission question and other kindred subjects associated with chauffeurs appear to be arriving at a critical stage.

Some few months ago we announced that automobile parts had been made at the great Krupp gun works for some time past. These famous works are now placing on the market complete steam cars. Their marvellous organisation will probably make their entry into the automobile manufacturing arena considerably felt by other German makers.

Fifty-thousand francs have been voted by the A.C. de France towards defraying the cost of the three days' fêtes they are holding in June next, when on the first day the Club have engaged the entire Paris Opera for a gala night, a dinner taking place on the second day at the Club House, and the third being devoted to a run to Fontainebleau Forest.

It is proposed by the A.C. of America to take out a club licence, and inaugurate a buffet bar. Hitherto the system in vogue has been a private locker system, no liquors being sold at the Club. These little cabinets mainly contained the wine-cellars of the various members, and to an English Clubman it was a strange sight to see each individual diner selecting his particular bottle from his store.

There is considerable heart-burning on the Continent over the date of the Gordon-Bennett Cup Race and Irish Fortnight, as the dates unfortunately clash very severely with several important events in France, and if some modification in the time of holding the meetings does not take place, the success of the fixtures will undoubtedly be jeopardised. The Aix-les-Bains meeting—which, by-the-bye, has been officially authorised by the Prefect of Savoy—organised by the Rhone Automobile Club, will be the one chiefly affected, the President of this Club going so far as to address a letter upon the subject to the British Club. However much it may be desired to avoid clashing with any of the Continental events, we fear the important issues involved in connection with the Gordon-Bennett Race will entirely preclude the possibility of altering the dates already announced except, perhaps, by a day or two.

In spite of the adverse resolution passed by the N.A.A.M., against holding commercial vehicle trials this year in New York—due, it is stated, to the fact that they consider the spring is the time when the motor manufacturers are busiest—the A C. of America have finally determined to carry out these tests for motor trucks and wagons on May 20th and 21st. The course will be entirely through New York, within the city limits, over a distance of 20 miles, which will be covered twice each day. The busiest streets will be selected, speed not being sought after, although in the upper part of the city, probably, it will be possible to maintain a good pace. There will be three classes, viz., for steam, electric, and petrol, each being sub-divided into four divisions according to carrying capacity, the amount of load for each division respectively being 750 lbs., 2,000 lbs., 3,500 lbs., and 10,000 lbs. The first day's run will be a non-stop test except for traffic requirements; on the second day specified stops will be made as if the vehicles were delivering goods.

Dealing with one of our paragraphs in which, amongst other matters, we recorded the pleasant suggestions of an American named Warren for "potting" automobilists by means of a rifle, the *Daily Telegraph* humorously enlarges upon the great possibility which the idea opens up. "Cars," says our contemporary, "would have to be armoured, and 'wind, rain, and bullet-proof suits' would be advertised. Some fine shootings might be let on the Surrey roads, and, even though the game was 'wild and strong on the wheel,' a brace of motor car drivers and a motor cyclist or two might often be bagged by the sportsman."

After discussion of the points of the proposed Bill of this gentle-minded Warren before the Hartford (U.S.A.) Legislative Committee, there is a prospect of several of the clauses being considerably modified. Evidently Warren is a man who likes his own way, as he made the following pronouncement when concluding his justification of his proposed measure:—"If the State doesn't pass a Bill, we will take action ourselves that will be effective. This matter is getting serious." It looks like a determination of carrying out his "potting" tactics. From the fact that Warren is terribly upset at the ridicule from the Press of which he has been made the butt, there is a certain amount of comfort for the American automobilist, as Warren in desperation announced that "as time passes on, and the unpleasant things of life are thrust upon us, we must submit; and if we have got to flee to the woods to make room for the automobile, the sooner the better." Quite so, Mr. Warren. The sooner the better.

In New Jersey the Scoville Bill has also been shorn of some of its terrors, and it has been officially determined to adopt the principle of so many minutes to the mile instead of so many miles to the hour. The speed to be allowed is at the rate of 1 mile in 6 minutes round sharp curves and at prominent cross-roads in the open country, 1 mile in 7 minutes in towns, and 1 mile in 3 minutes in the open country. Individual cities, boroughs, or towns can permit greater speed if they wish in their particular district. In Tennessee some old highway law has been unearthed restricting the use of steam vehicles on the public highways, and it is proposed to endeavour to enforce this against steam automobiles. The measure includes double toll for bridges or roads, a watchman walking 200 yards in front, and liberty only to run steam vehicles on the roads between the hours of 9 p.m. and 4 a.m., the vehicles always having to be brought to a standstill on the approach of any wagon, buggy, or horseman until the same have passed. Violation of any of these rules is a misdemeanour. Altogether the American automobilist's lot is not a happy one.

The disgraceful chaos of New York's streets, where every reckless teamster is a law unto himself and a menace to the rest of the community, could not exist a single day in either London or Paris. The much-abused and reformed-to-death police department of that city could certainly occupy its time to greater advantage in repressing the hoodlums of the heavy trucks rather than in playing sleuth around saloons or gambling houses. At any hour of the day the scene at Fifth Avenue and Forty-second Street is a disgrace to America. A livelong scramble for place between street cars, heavy trucks, and horse-drawn carriages makes the spot a maelstrom in which the helpless pedestrian is so much human driftwood. The luckless policeman, who stands in the roadway and occasionally manages to secure a more or less safe crossing for scurrying women, has all he can do to reply to the wholesale abuse hurled at him by liveried coachman or grimy teamster without discrimination. From the above description of the state of the New York street traffic, which is not ours, but is taken from the pages of an American contemporary, it may be gathered that even the Americans do not claim to be superior to the British in *all* things. From the same source it also appears that the only traffic which the police can control and regulate is the traffic of automobiles, from the fact—again we give the words of our contemporary—"the drivers of these vehicles being necessarily men no doubt with more than horse sense." An excellent suggestion is made by our contemporary that the trials of commercial automobiles, being organised by the A.C. of America, should be officially recognised by the New York police department, in which case a splendid demonstration of the practicability of these vehicles would be obtained and an advance thereby made towards the reform of the traffic question, which would bring about considerable advantages to the automobile industry. The particular occasion for this onslaught on New York methods is the visit of Deputy-Commissioner Piper, of the New York police department, to Europe in order to study the question of regulating city traffic.

The Stanley Motor Show for 1904 has been abandoned.

The Electric Battery Company, of Coldharbour Lane, Brixton, have removed to more important and central premises at 180, High Holborn, W.C.

The Hart Accumulator Company, Marshgate Lane, Stratford, are extending their department for supplying cells for motor car ignition work. These can be supplied singly or in two or three compartment cases of ebonite or celluloid.

The Brush Electrical Engineering Company, of Loughborough, have had in use for some time, in connection with the building of tramcars, a complete plant for making pressed steel frames. They have now extended their patterns, and are in a position to give quotations to the trade for the same type of frame for motor carriages.

In the new catalogue to hand of Messrs. Smith, Parfrey, and Co., Limited, of the Pimlico Wheel Works, Fulham Palace Road, their well-known makes of motor car wheels are shown in various forms and sizes. Other specialities of the firm are also illustrated, the various forms of motor axles, springs, combined brake drums and sprockets, and stamped forgings for motor work being clearly shown in its pages. Of these special standard forgings about 60 different patterns are given. A copy of the catalogue will be sent free on application to the works of the Company.

Automobilists in Hampshire are being well catered for by the Imperial Motor and Cycle Repairing Works, of 5, High Street, Lyndhurst. Considerable extensions are being made by the proprietors, and during the coming season they are arranging to extend their arrangements for hiring out cars. It has also been found necessary to increase the staff for repairs and overhauling, and the garage will be open day and night to meet the convenience of customers, mechanics being sent any distance immediately on receipt of a wire.

Vaughan and Brown, Limited, is to be wound up voluntarily. The liquidator is Mr. H. Meredith, 95, Finsbury Pavement, E.C.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Anderson Motor Tyre Company (Limited), 12, Great Dover Street, S.E.—Capital, £2,500 in 2,475 ordinary shares of £1 each and 500 "A" ordinary shares of 1s. each.

Automobiles de Luxe (Limited).—Capital, £200 in £1 shares. Object, to manufacture, repair, buy, sell, let on hire, all kinds of autocars and accessories.

Bath Garage and Motor Company (Fuller's) (Limited).—Capital, £10,000 in £5 shares (1,600 preference). Object, to adopt an agreement with W. T. Edgar, to acquire the business of the Bath Garage and Auto-Car Company, and to carry on the same and the business of mechanical and electrical engineers, manufacturers of and dealers in motors, motor cars, cycles, carriages, and other vehicles propelled by electricity, petrol, steam, or other power, &c. No initial public issue. The first directors (to number not less than three nor more than five) are S. C. L. Fuller, W. T. Edgar, and R. C. L. Fuller. Qualification, £50. Remuneration, £150 per annum, divisible.

Begbie Manufacturing Company (Limited), Cumberland Park, Willesden Junction.—Capital, £10,000 in £1 shares (4,000 preference). Object, to adopt an agreement with A. Firth and S.D. Begbie.

British Motor Tyre Syndicate (Limited), Northern Assurance Buildings, Albert Square, Manchester.—Capital, £50,000 in £1 shares.

Holderness Motor Company (Limited).—Capital, £10,000 in £1 shares. The first directors are R. J. Jackson (chairman), R. D. Bradford, and J. M. Wilson.

London Motor-Omnibus Company (Limited).—Capital, £15,000 in £1 shares. Chief object, to acquire the business of the London Motor-Omnibus Syndicate, Limited. The first directors are D. R. Abrahams, A. P. Milbank, and A. C. Walter.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1901.

Published March 26th, 1903.

24,600. M. Crawford. Self-propelled vehicles.

Applied for in 1902.

Published March 26th, 1903.

5,694. W. N. Dumaresq. Method of driving cycles, motor cars, &c.
6,688. W. Barnsley. Motor bicycles.
7,539. R. Lucas. Petroleum motors.
8,361. E. J. Pennington. Motor road vehicles.
8,775. T. W. Ellis. Electric ignition indicator.
8,881. R. M. Howison. Pneumatic tyres.
9,347. A. R. Bellamy. Cylinders.
9,436. W. A. Crowdus. Brake.
9,551. C. Osborn. Change-speed gear.
12,845. W. J. Lloyd and W. Priest. Motor bicycles.
24,259. Soc. Anon. Franco Belge. Method of attaching gear cases, or casings for motors.
26,286. A. Herisson. Friction clutches.
27,224. E. Cushing. Solid rubber tyres.
27,592. P. T. Somerville-Large. Metal rims or felloes for wheels.
28,959. — Fielder. Variable speed gearing.

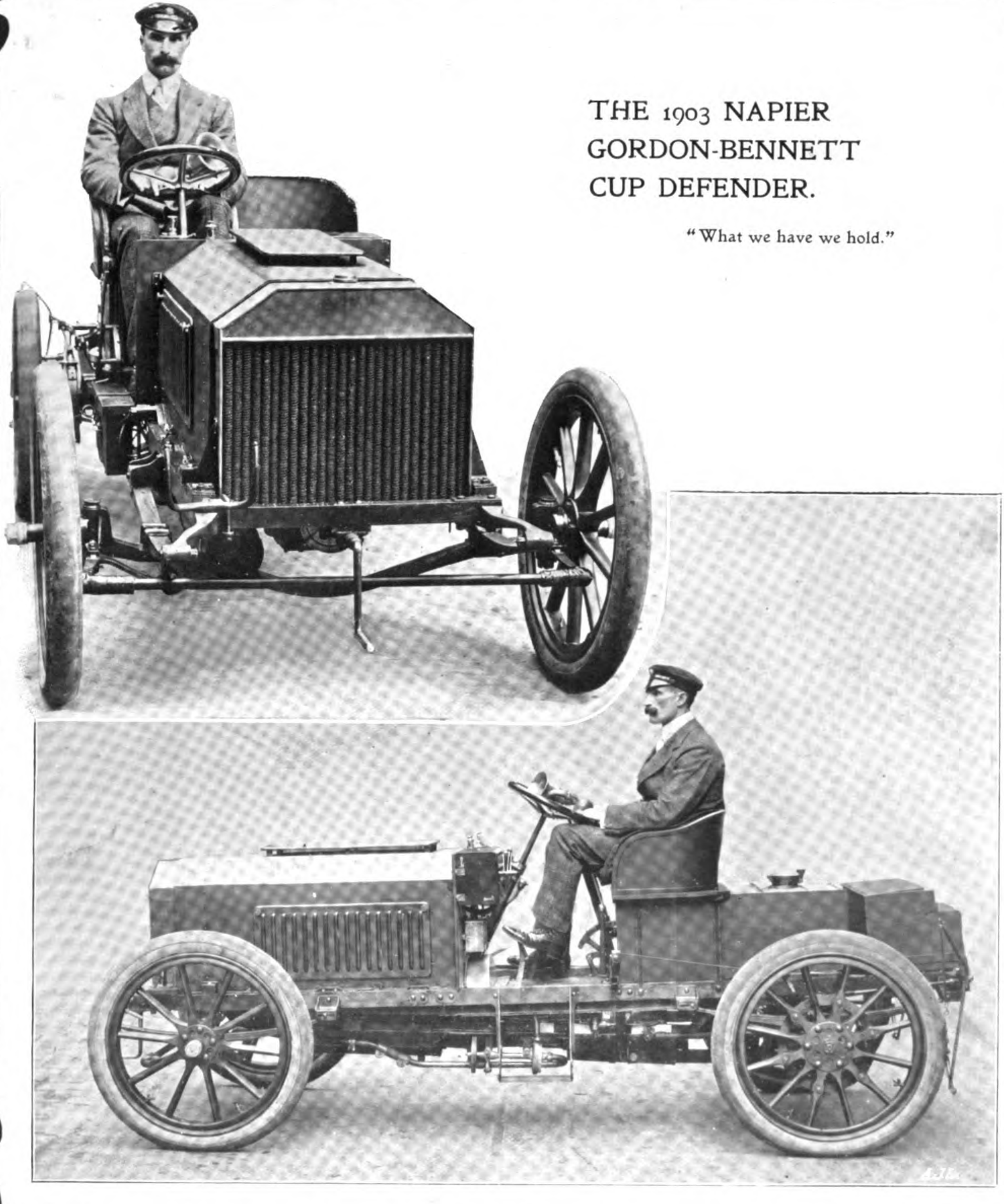
Published April 2nd, 1903.

5,798. A. F. Scott. Internal combustion engines.
6,199. — Vogt. Internal combustion motors.
6,258. G. H. and C. F. Enderby. Internal combustion engine.
6,767. J. H. Braithwaite. Free wheel and variable speed gear.
8,023. R. F. Hall. Explosion engines.
8,456. F Bryan and A. H. Bayley. Electric ignition devices.
9,251. T. B. Murray and N. O. Fulton. Apparatus for governing and varying speed.
14,946. W. H. Porter. Explosion engines.
15,312. L. A. Genard. Accumulators.
26,177. H Ledermann. Air brakes.
27,810. C. Berg. Driving mechanism.
28,531. F. Charron. Shaft connecting gear.

Supplement to the "Automotor Journal," March 28th, 1903.

THE 1903 NAPIER GORDON-BENNETT CUP DEFENDER.

"What we have we hold."



Mr. S. F. EDGE'S 1903 GORDON-BENNETT CUP NAPIER CAR.

In our plate we show the first Napier Cup Defender built for 1903—with Mr. S. F. Edge driving. The car is similar generally to last year's Cup Winner, and has "direct drive" on top speed. It weighs 17½ cwts.—a little heavier than last year—and the wheels are the same size as before. No shackles are used for the suspension spring, and a special form of clutch is employed, giving unusual flexibility of drive.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

Offices: 44, St. Martin's Lane, London, W.C.

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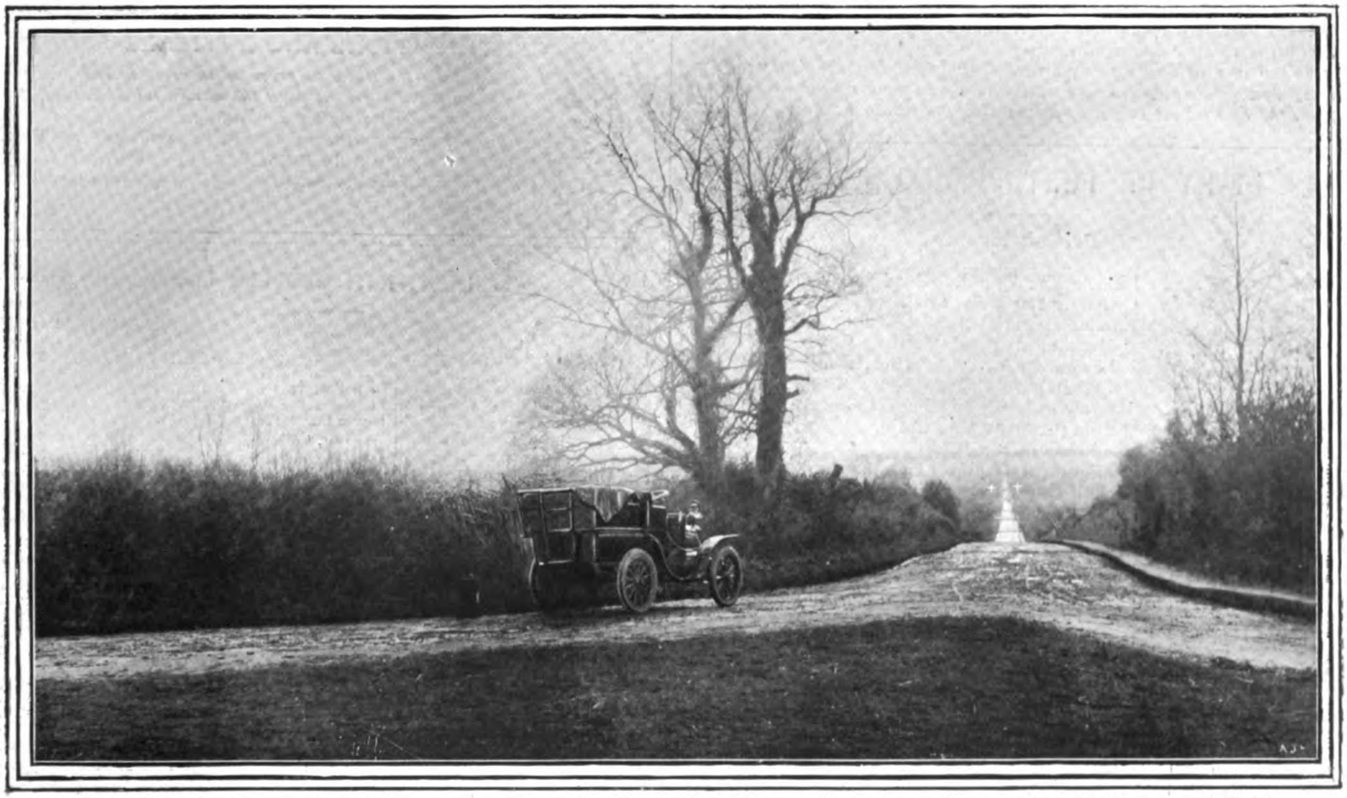

(Photo by W. Lawrence, Dublin.

THE GORDON-BENNETT COURSE.—View of the 10 mile "straight" on the Athy-Kilcullen road, looking from the Moat of Ardscull towards Athy.—Ballyshannon Cross Roads —the starting and finishing point—are situated at the point marked with a white cross.

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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
April 16		Lincolnshire Auto Club Road Surveyors' Luncheon.
*April 24		Quarterly 100 Miles Trial.
April 25		Eliminating Trial Gordon-Bennett Race.
April 27, May 4, 11, 18		"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14		Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
*June 13		Gymkhana at Ranelagh.
July 1	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2		Gordon-Bennett Race.
July 3		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4		Speed Trials, Phœnix Park.
July 6		Tour to Newcastle and Belfast.
July 7		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy.
July 8		Return to Dublin.
July 9		Start for Cork.
July 10		Arrival at Cork.
		Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13		Start of Tour through the South.
July 14		Arrival at Killarney.
July 15		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
July 24-25		Southport Speed Trials.
*August		Tourist Motor Bicycle Reliability Trial.
*September		The 1,000 Miles Trial.
1904.		
		*Light Van Trials.
*Feb. 12-24		Crystal Palace Exhibition.

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
April 16-20	A. C. de Touraine Tourist and other Trials.
May 9-14	Belgian National "Circuit."
May 14	Paris-Madrid. Start of Tourist Section.
May 16-24	Stockholm Exhibition.
May 18	Speed kilom.—Geneva (Swiss A. C.).
May 24, 25, 26	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June	Austrian "Circuit."
June 18, 19, 20	Automobile Club Fêtes—Paris.
June 18-23	Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 18-July 28	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21	Circuit des Ardennes.
June 28	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16	Race Trelex-Saint-Cergves (Swiss A. C.).
September	Udine Exhibition (Italy).
Oct. 15-21	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

THE GORDON-BENNETT BILL—THE ROYAL ASSENT.

THE Gordon-Bennett Enabling Bill has finally received the assent of His Majesty the King. It is a result on which all automobilists of this country, and particularly Mr. Scott Montagu, who has so ably piloted the Bill through the Commons, deserve the heartiest congratulation. We also take some small share of credit for the happy result to ourselves. As pointed out on a former occasion, we were the first to advocate the policy which has been adopted, and which has led to this satisfactory conclusion. There is practically no doubt now that the great automobile race will be run on Irish soil, and that the "Gordon-Bennett Fortnight" will bring a large influx of automobile visitors to the sister island, to the no small benefit of many persons in that country, and no doubt to the considerable pleasure and satisfaction of the visitors themselves, some of whom at any rate will on that occasion make their first acquaintance with the charms of Irish scenery and the amusing attractiveness of the Irish people. The occasion is one on which it is well that a few remarks should be made to draw the attention of strangers to some of the peculiar characteristics of the Irish peasantry. Except, of course, where the roads are kept on the day of the race, or the other events for which the Bill provides are being run off, visitors will find the Irish roads in many respects very different from English thoroughfares. Between village and village, and small town and small town, there is, on market days particularly, a larger degree, as a rule, of small traffic than in similar sparsely populated districts in England. It is also a traffic which entertains a very supreme contempt for the laws of the road. The Irishman, in his donkey or pony trap, drives all over the place, and automobilists will have to bear this carefully in mind. It is not compulsory, either, in Ireland to carry a light after dark. Nobody does so, nor would they, probably, if it were. This adds an additional danger, of which full reckoning must be taken; but perhaps most trouble will arise from the habit ingrained in the Irish peasantry of turning out their animals to graze on the roadside wherever there happens to be a palatable tract of grass. It is consequently by no means uncommon to encounter quite suddenly a regular drove of donkeys, mules or ponies, or a combination of these three varieties of the equine race. The donkeys, at any rate, are much addicted to rolling in the dust of the high road, and not infrequently, in out-of-the-way districts, go fast asleep thereon. Dogs, also (the licence being only 2s. 6d.), are a perfect plague, and often a serious danger.

◆

A PECULIAR characteristic of the Irish race should also be borne in mind by visitors. None of the automobilists who go to participate in the Gordon-Bennett Fortnight will be anxious to do anything but benefit the extremely poor country people who have behaved so well over the whole question, and supported the project so enthusiastically without a dissentient voice. They may possibly collide with a donkey and perhaps put him *hors de combat*. More frequent are likely to be collisions with ducks and hens and the geese, which in some parts of the country are maintained rather largely. Offers of remuneration will be in most cases refused at first. Visitors must not allow themselves to be put off by this. It is the ingrained courtesy of the Irish peasant which prompts him to refuse such offers. A reasonable sum must simply be pressed into his hand, and he must be made to take it. In spite of the poverty and frequent squalor of his surroundings the Irish peasant possesses many of the instincts of the *grand seigneur*. But he cannot afford them.

◆

JOY IN SURREY.

NOTHING more readily excites human sympathy than the spectacle of a "good man struggling with adversity." It was the fate of Col. Crompton to appear in this unhappy *rôle* in a case last week. As a Vice-President of the Automobile Club he appeared to feel his position with peculiar keenness, and he made a vigorous and pertinacious, though perhaps not very well judged, defence in person. He was his own solicitor, and the Chairman of the Bench appeared to be "judge, jury, and parsecutin' counsel all in one." The charge was the usual one, and so, of course, the Colonel was convicted. Col. Crompton adopted two lines of defence. He disputed the accuracy of the constable's stop-watch because he had a Government apparatus on the car which indicated that he was travelling at exactly 17½ miles an hour. But since the York perjury case we fail to see that there is any use in confronting a policeman's stop-watch with any evidence of its falsity, whether in the shape of a Government apparatus or anything else. For the jury in that case, directed by the judge, were of opinion that the watch with which a policeman takes the time might be a stop-watch in the sense that it is one that refuses to go, provided another stop-watch that will more or less measure time is kept at home and produced in court. The other line of the Colonel's defence was that, in order to commit a breach of the law, the car must travel more than 12 miles in an hour. We wish this interpretation could be put upon the Act, but we fear it cannot. But the chairman's method of meeting it was characteristic. He said, "Then I shall advise the Bench you were going at a reckless speed and entitled to be convicted," a point on which no evidence whatever was offered. Colonel Crompton also asked to be acquitted, or, at any rate, leniently dealt with, both because it was his first offence, and because his authority, as Vice-President of the Automobile Club, when endeavouring to discountenance rapid driving amongst its members would be impaired. Very naturally this appeal *in misericordiam* left the chairman of the Bench unmoved. His heart had been previously hardened to more than the usual magisterial impenetrability by the *Automobile Club Journal*. Brandishing a number of this publication, he declared that he found therein this amazing statement, "The chairman of the Kingston County Bench was seen out measuring the Portsmouth Road," and is reported to have concluded, "A paper which could publish such an unmitigated lie as that ought not to be read by respectable people."

◆

OF course we all know that Col. Crompton is not really more to blame for this statement appearing in the club *Journal* than the chairman of the Kingston Bench himself. He has nothing to do with the editing of it, and he is not even on the Editing Committee. The incident is an instructive illustration of the manner in which the influence of the club is liable, as we pointed out last week, to be prejudiced by the *Journal*. The chairman might just as well have brought up the passage, of which he very naturally and properly complained, against any other member of the Automobile Club as against Col. Crompton. The insertion in the pages of the club *Journal* of the passage in question is also an apt illustration of the observations we made about the manner in which it is conducted and the comparative irresponsibility of its staff. The editor or proprietor of "an outside journal" would take good care that a mis-statement of this kind did not find its way into his columns. Perhaps it is not exactly a libel, though it comes pretty close to it. But it is certainly calculated to exasperate the Surrey magistrates, and the Kingston Bench in particular, against the proprietors and owners of the club *Journal*, that is to say, the Automobile Club.

UNDIGNIFIED DEFENCES.

WE have dealt with the above case at some little length, both because it is so characteristic of these proceedings in general and on account of the prominence in the automobile world of the unsuccessful defendant. Like a number of other similar cases, it forcibly raises the question as to whether automobilists are wise or dignified in adopting this sort of line where there is no real defence to be offered. The law is absurd and antiquated, that we all agree, and there is much to be said against the authorities who control the police compelling them to concentrate all their energies on attempts to obtain convictions for merely technical breaches of it. But where a defendant has been travelling considerably above the legal limit, where he is perfectly aware of the fact, and only claims that the policeman may have somewhat over-estimated his speed, we really fail to see what object is gained by his making fierce fights, either single handed or backed up by counsel, in the attempt to escape the infliction of a fine. Where there is some point in dispute, such as that which came up frequently in regard to steam vehicles about emitting visible vapour (and now seems finally disposed of), let it be fought by all means, and fought as hard as can be, but because a policeman is a mile an hour wrong in his estimate of speed, it is not to be expected that magistrates will believe that the speed limit has not been considerably exceeded. Even if they refuse to convict under such circumstances, the prosecution could, if they liked, apply for a *mandamus* to make them. We really think that the wisest and most sensible course for every automobilist to adopt, in cases of this kind, is to write politely to the Chairman of the Bench, admit that he believes he was exceeding the speed limit on the occasion in question, plead guilty to the charge, and state his readiness to pay what fine the magistrates think fit to inflict. He will probably get off extremely lightly. The longer he fights and the more he says the more severely in general will he be fined. Attending in person and fighting a case generally takes up the greater part of a day. A professional man's time is generally sufficiently valuable to make the loss of a whole day more serious than the fine, and even if he is a private individual he loses a day in which he might have amused himself, and spends it irritatingly under humiliating surroundings. The main business of petty sessional courts, before the advent of the automobile, was dealing out punishment to defendants who were usually guilty of the offences laid to their charge, and of a good many others as well. Naturally the surroundings have become squalid, and the officials inconsiderate. Even the well-to-do commercial man, who is compelled to appear there as a prisoner, is bound to feel irritation and humiliation. To the gentleman of refinement and culture the ordeal is one often enough of extreme degradation. Is it worth his subjecting himself to it for the sake of a wordy duel with magistrates, who, for the time being, ill-luck and absurd legislation have constituted his judges—a duel that he knows perfectly well he is morally certain to lose? Frankly we do not think the game is worth the candle. Of course the magistrates have the power to compel his attendance, but where a defendant writes and pleads guilty in the manner we suggest they practically never enforce it. We feel certain that it is mainly through not knowing this that many automobilists expose themselves to loss of time, humiliation, and annoyance, which are far more unpleasant than the mere monetary ss and waste of time involved.

THE POLITICAL POWER OF THE MOTOR.

IT is all very well for politicians to persuade themselves that Parliamentary elections are decided by the political views of the voters in the constituencies. The automobilist, or any other wise person who is an observer and student of events, knows better. He knows that elections are decided by motor cars. The candidate who is supported by the largest phalanx of motor cars wins the seat, whether his principles be Conservative, Roseberian, or Liberal, or whether, like Sir Boyle Roche, of the old Irish Parliament, he has no principles at all, will head the poll. Bury, Rye, and Chertsey demonstrate the fact. Rye was a predominantly Conservative constituency, but the Liberal candidate had many more motor cars at his service than his rival, and, presumably, after taking rides on his cars, the free and independent electorate could not bring themselves to vote against him. At Chertsey Mr. Fyler had upwards of forty motor cars, Mr. Longman only twenty. A motor car seemed to be good for about 100 votes. And the way they rushed about on the polling day! Each one of them averaged 100 miles, and the number of voters they transported was stupendous. As for the speed limit, nobody heard anything about it. It must have been a severe temptation to the Surrey police, and if Inspector Marks and Sergeant Jarrett have not had a *crise des nerfs* this can only have been due to the counter excitement of attendance at the polling-booths. Long before midday the most agricultural of the voters were turning up their noses at horse-drawn vehicles, even of the most sumptuous kind. In fact, luxurious carriages stood empty, while the motors rushed about like whirlwinds. An elector of Egham, who was invited to approach the polling station in a governess cart, made it plain to those to whom it belonged that he regarded a governess cart as a particularly objectionable form of corruption, and that if he couldn't have a motor car he would prefer to walk, and please himself for whom he voted. He got the motor car. At Chertsey an old gentleman walked several miles into one of the Committee Rooms and enquired when a motor would be sent to fetch him. It was explained to him that the polling station was just next door, and that he could perform his duties as a citizen with very trifling inconvenience on the spot. Not he! He was going to the poll in a motor car, and he explained that if that Committee could do nothing for him he would make application to their rivals; so it was agreed to send a motor for him at half past eleven o'clock, and he walked contentedly home to wait for it. No! the days when people voted on principle are gone, apparently for ever. They vote by motor cars now. Think what a power it is. How ridiculous that the industry should consent to groan under an antiquated law! It rules the elections. It can obviously free itself from its trammels. In future elections let the Automobile Club canvass every candidate's opinions on the speed limit. Where one agrees to its abolition and the other does not, let them at the next election place all the cars they can at the disposal of the progressive candidate Let this course be followed on a few occasions and the day is ours. We shall get all we want and more.

LORD IVEAGH and Mr. W. J. Pirrie announced on Wednesday night their intention to take up the transport question in Ireland, particularly to assist agriculturists under the new Land Bill. We sincerely trust and believe they will not lose sight of the enormous possibilities of automotors in their splendid scheme.

THE GORDON-BENNETT CUP AND THE IRISH FORTNIGHT.

(Photo by W. Lawrence, Dublin.)

The Gordon-Bennett Course.—A winding road near Maryboro', looking South West.

This week we are able to publish a few views of the course which will be traversed by the Gordon-Bennett racers in their efforts to secure the much coveted trophy.

As a result of the work of the Special Commission appointed by the Club to settle details in connection with the course, practically all the controls have been mapped out, and other arrangements made. The longest control will probably be about 2¼ miles at Kildare. The finest running will probably be seen on the Athy-Kilcullen road, where, with the exception of a curve about one mile

(Photo by W. Lawrence, Dublin.)

The Irish Fortnight.—Kilrush Hill, looking South West.

from Athy and another round the Ardscull Moat, the course is practically dead straight for about ten miles. Our frontispiece this week shows this road as seen from the Ardscull Moat at the cross-route between the Athy-Kilcullen and the Kilcullen-Carlow road. It will be necessary to stop each car at this point, as otherwise there might be a collision between a car which has to turn to the right and a car which is going straight on. Controls will be established at Athy and Castledermot, and the really only serious hill in the entire course is the Windy Gap, immediately outside Stradbally village. The Club enclosure will be in some meadows on the Athy-Kilcullen road, the start taking place on a slight down gradient situated about 100 to 200 yards south of the Club enclosure. The Club enclosure is about 7 miles from Kildare Station, and probably an entrance of half a guinea will be charged to members for the privilege of making use of this point of vantage. A public enclosure, under the control of the Club, will also be provided opposite the Club enclosure, for which a moderate charge will be made.

Although not as advantageous a position as the Athy-Kilcullen road, an excellent view will be obtainable from the Curragh. The cars will only pass there half as many times as on the former road, and in addition the cars will not be travelling at their best past the Curragh, as the ground is slightly uphill at this point.

The competing cars will probably be on exhibition in Dublin the day before the race, when the official weighing will also take place.

The order of running for the cars, as foreshadowed by Mr. Johnson, will be, provided each challenging Club brings its three cars up to the line:—1st, Mr. S. F. Edge, on a Napier, as holder of the Cup; 2nd, Chevalier de Knyff, for France, on a Panhard; 3rd, one of the American cars, they having challenged before the Germans; 4th, Baron de Caters, on a Mercedes, for Germany; 5th, Mr. Charles Jarrott, on No. 2 Napier; 6th, Mr. Maurice Farman, on No. 2 Panhard, for France; 7th, one of the American cars; 8th, a Mercedes for Germany, probably driven by M. Degrais; 9th, the third British car, either a Star driven by Mr. Lisle, jun., or a Napier driven by Count Zborowski, Mr. Mark Mayhew, or Mr. Holder; 10th, a Mors car for France; 11th, No. 3 American car; and 12th, another Mercedes on behalf of Germany. Two minutes interval will be given between the starting of each car.

It is hoped that Lady Dudley will, at the conclusion of the race, make presentations to the various competitors from the Club enclosure.

The identification of each country's cars will be easy in consequence of the distinctive colourings, but it will not be so easy considering the pace at which the cars will be travelling, to distinguish which of the cars is passing. Mr. Johnson has made an excellent suggestion that either one, two, or three strips, as the case might be, should be placed in front of the various cars, by which method the individual cars could be very quickly identified.

The Aero Club propose having a captive balloon from which photographs will be taken of the race.

M. de Knyff has expressed himself as very fairly satisfied with the course, but he regards somewhat with disfavour the fact that over a considerable portion of the road it will be impossible for the cars to pass one another at the pace. From Paris comes a suggestion that it would be better to start the race at four or five in the morning, as if the weather happens to be hot the strain of running for so long as nine hours in the sun will add very considerably to the strain which the drivers have to bear.

The exact distance round the circuit of the figure 8 is 103 miles 758 yards. This will be covered three times and the western circuit once, the latter being equal to 58 miles 151 yards, making a total for the entire course of 368 miles 765 yards. The suggestion that competitors' cars driving over the cup course previous to the race at a speed of over 40 miles per hour should be disqualified, has been so far declined by the A.C. of America.

For the various events there will be a number of prizes and cups offered. Amongst these will be a 200 guinea Challenge Cup, which the Dunlop Company have offered to the Irish Automobile Club, and two cups by the Greater Cork International Exhibition, one for a 3-mile race, and the other for a hill-climbing competition. In connection with these two latter cups there is close to the city of Cork a straight and level road of about 2½ miles, which would give a splendid course for speed trials on the flat, and there is also a 6-mile hill with gradients ranging from 1 in 15 to 1 in 20. Messrs. Thornycroft and Company are building a motor launch which they have entered for the Harmsworth Cup.

The Dunlop Company have further extended their permission to bring pneumatic tyres into the United Kingdom to foreign visitors taking part in the Irish fortnight, provided the numbers are notified beforehand to the Automobile Club, and the tyres are taken out of the country again within a fortnight of the Cup race.

* * *

An Automobile Volapuk.—A Parisian contemporary suggests the formulation of a universal language for automobilists, and the arrangement of a congress under the auspices of the Automobile Club de France for carrying out the idea in practice. The notion is that the main features of an automobile and the troubles and misfortunes to which it is liable should be codified in a set of international terms in which the most suitable expressions used by the leading European nations should, with some modification, be embodied. It is a nice dream, but we fear not very practicable. Something of the kind, indeed, was tried years ago in connection with bicycles, but it was not a success. A congress of the kind suggested might, however, prove beneficial. Codification of the terms used, not into a common jargon, but in the form of an English, French, and German vocabulary, would prove very useful. The congress might go even further and settle the signification of certain terms in the different languages, and even invent some where they do not at present exist. Terminology is really a serious difficulty in a rapidly growing industry like automobilism, and there is at present much want of agreement, not only about the equivalents of the words used in one language with those adopted in another, but even as to the employment of the words themselves. Very often, too, one language has a term for a part, while another language has not, and the expression used in one language might by agreement be adopted in others. It has already been done without agreement to a certain extent, of which the use of the French word "chassis" is an example. The publication of an authoritative dictionary, as the result of the labours of such a conference, would be beneficial to everybody, and not least to journalists.

THE SOAMES PETROL CAR.—PART II.

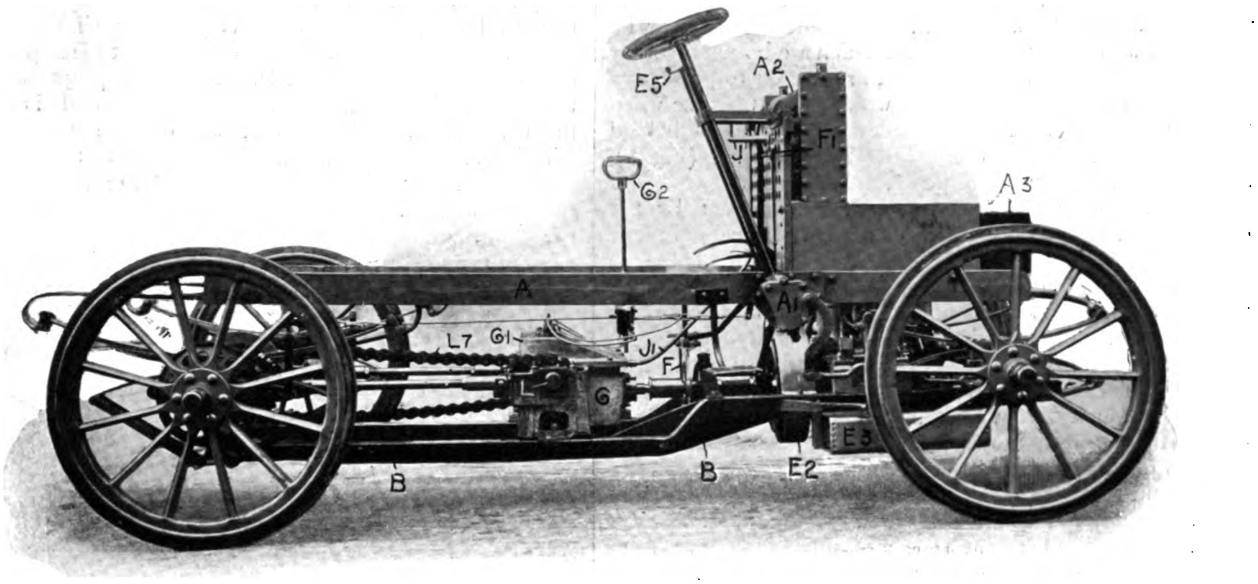


Fig. 6.—Side View of "Soames" Chassis.

We described the general characteristics of this interesting vehicle last week, and the details of the special system adopted for separately suspending the machinery upon an underframe were set forth at some length. The accompanying Figs. 6 and 7, which are side views of the chassis, have already been referred to; in conjunction with the plan view, Fig. 2, they render the arrangement of the parts very clear.

Fig. 8 is a photographic view of the dashboard, showing the regulating levers and pedals; a part of the main clutch, E^2, and of the brake, F (on the shaft connecting the clutch with the gear-box), are seen in it, together with the system of levers employed for operating the clutch and the brake, without interfering with the free movements of the upper frame, relatively to the underframe. The shaft between the clutch and the gear-box takes a bearing at its forward end inside the crank-shaft, and it is also carried in a bearing fixed across the underframe. The male portion of the clutch is mounted on its forward end, the brake disc, F, is fitted to it immediately behind the fixed bearing, and at its rear end it engages, by means of a flexible coupling, with a longitudinal shaft which passes through the gear-box, G.

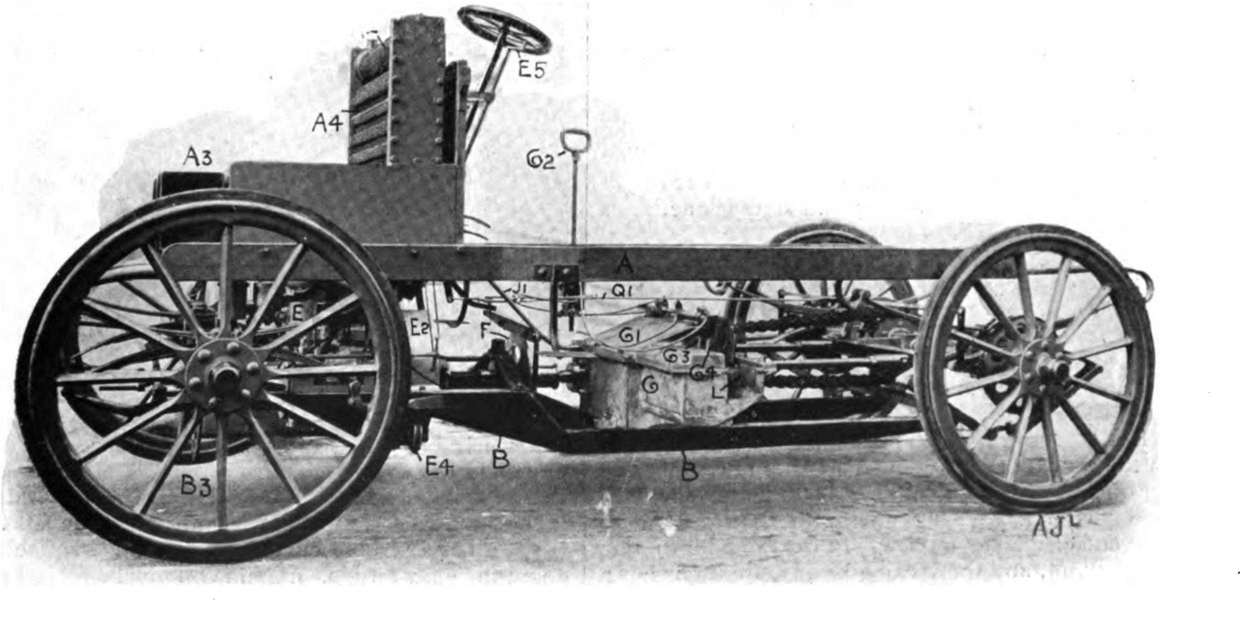


Fig. 7.—Side View of "Soames" Chassis.

In Fig. 9, which is a view of the change-speed-gear, with the cover removed, the longitudinal shaft referred to is marked H. The brake disc, F, has bevelled faces near its periphery, and a pair of levers, F^5, which are bolted together with distance pieces between them, are caused to press in a wedge-like manner against the two faces of the disc when they are depressed. The double lever, F^5, is normally held out of engagement with the disc by the spring, F^6 (Fig. 8), and it is operated by a foot pedal, F^4, as shown.

The main clutch is drawn out of engagement by the clutch pedal, F^2, and the lever arm which is made in one piece with the foot-pedal, and projects downwards, is free to slide in a vertical direction against the face of the lever pivoted to the underframe and forming the clutch fork at its other end. The clutch can be held out of engagement by means of a small eccentric, F^1, on the dashboard. The eccentric block can be rotated by hand, and its strap is fixed to a vertical rod, which carries a stop-piece, F^3; it causes the stop to move upwards or downwards as the position of the eccentric is changed. The stop-piece, F^3, lies behind the foot-pedal forging, F^2, when in its lowest position, and, therefore, holds the clutch out of engagement. When the car is at rest, and this safety lock is in use, the engine can run quite freely, and the entire transmission gear mechanism remains stationary.

The change-speed-gear consists of a first-motion-shaft, K, and a second-motion-shaft, L. The one shaft has spur-wheels, K^1, K^2, K^3, and K^4, which are at all times in mesh with those on the other shaft, L^1, L^2, L^3, and L^4. The first-motion-shaft, K, has a bevel-wheel, K^5, on its one end, by which it is driven either forward or backward by small bevel-wheels mounted upon the longitudinal shaft, H. One of the small bevels, H^1, is seen in Fig. 9, and the other is arranged upon the front end of that shaft inside the gear-box. Either of these wheels can alternatively be brought into mesh with the larger wheel, K^5, and thus a forward or a backward motion is imparted to the shaft, K. The bevel-wheels are controlled by a shaft, H^3, which is connected with the reversing lever, J, on the dashboard by a flexible shaft, J^1. The shaft, H^3, carries the cam, H^5, and terminates in a lever-arm, H^6, the end of which is connected with the gear-box by a spring, H^7. The paths cut in the cam engage with the pin, H^4, in such a manner as to cause it to move backwards or forwards, and to carry with it the bevel-wheels on the shaft, H, to which it is connected by means of a fork. The cam is so shaped that the pin, H^4, is securely locked by it whenever either wheel is in mesh; and a quick action is obtained by the spring, H^7.

The wheels on the first-motion-shaft, K, are rigidly fixed to it, but those on the second-motion-shaft, L, which correspond with them, are mounted freely upon that shaft. The novel feature of the gear consists of the precise method adopted for rendering either of the wheels, L^1, L^2, L^3, and L^4, rigid with it, and for securely locking the key in place after it has been introduced into the hub of that wheel. In Fig. 10 we have photographed a wooden model, in which the wheels are represented without any teeth, and a portion of each has been cut away in order to show the method adopted for providing them with bearings, and to expose the end of the key to view. In the same illustration the sliding key, M, and the locking key, N, are both shown separately, and the collars, M^1 and N^1, by which the keys are moved longitudinally, are also in evidence. Fig. 11 is a longitudinal section through the two shafts, L and K, and a cross section through the former. The shaft, L, has a deep key-way cut in it from its one extreme end, extending inside all the gear wheels. It is provided with sleeves, in order to form the bearing surfaces where it is supported on either side of the gear-wheels. The shaft projects through the oil retaining casing, and its other end is carried in a ring-lubricated bearing, L^4, outside the sprocket wheels, L^5, from which a pair of chains pass to the differential gear on the rear axle. The gear-wheels are carried on loose bearing rings, P, which are turned so as to ride freely upon the shaft, and which afford large bearing surfaces for the wheels to revolve upon. These rings may be regarded as floating because they are free to revolve independently of the wheels, or of the shaft. Their inner faces are bevelled, as seen in Fig. 11, so that the pivoted end, M^2, of the key, M, can force its way beneath them. The two keys, M and N, fit in the key-way, the former lying above the latter. The key, M, has a pivoted end piece, M^2, which is free to move about the fulcrum pin, M^3, and is normally forced outward by the spring, M^4. The end piece, M^2, has a rounded profile so that it can find its way beneath the floating rings, P, and can insert itself in a key-way inthe hub of either

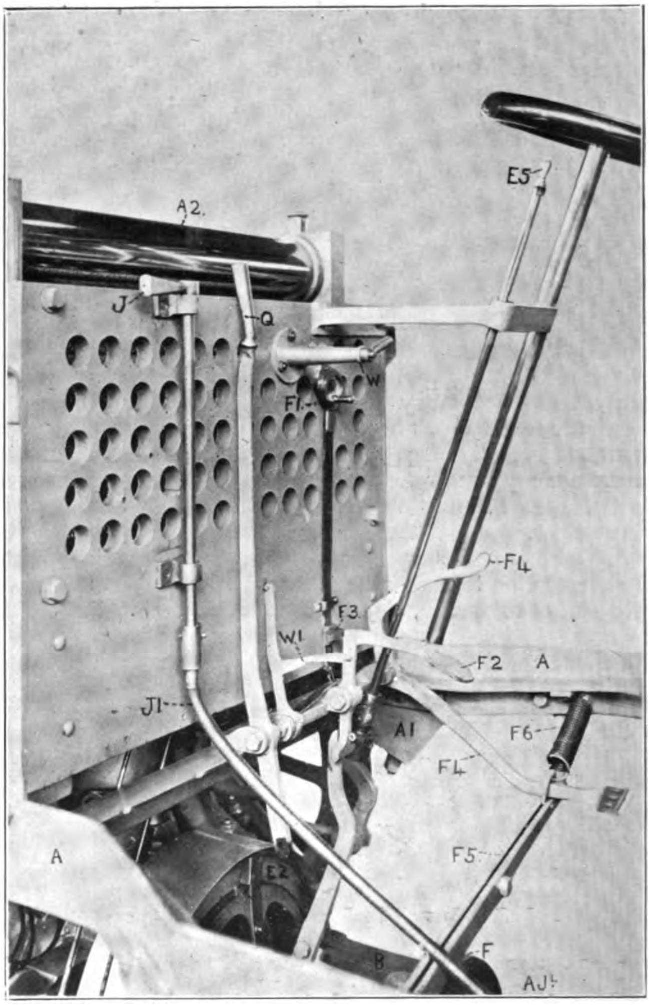


FIG. 8.—View of Dashboard, Regulating Levers and Pedals, and Foot Brake.

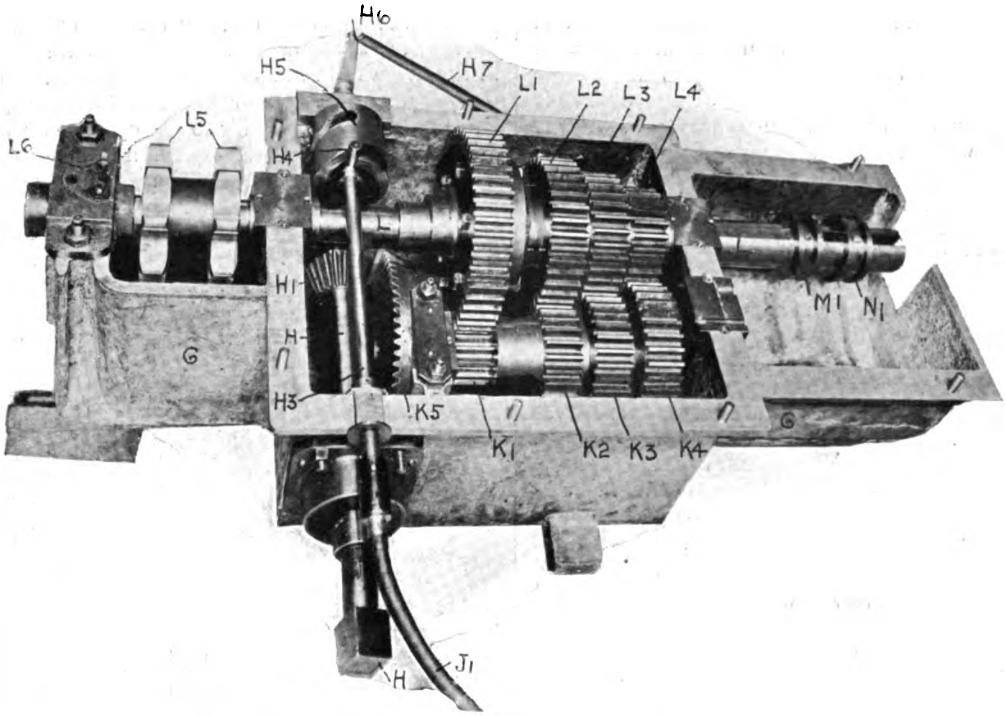


FIG. 9.—View of Gear-Box with Cover Removed.

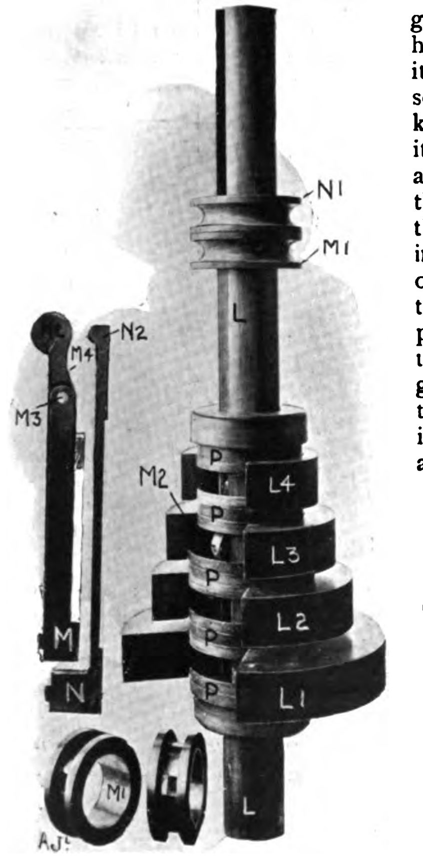


FIG. 10.—Sliding Keys and Wooden Model of Second-Motion Shaft.

gear wheel. The key N, has a projection, N^2, on its inner end, and this is so shaped that when the key is forced inward, its projection presses against the underside of the pivoted piece, M^2, of the other key and locks it in position inside the hub of the gear-wheel. By this arrangement it is impossible for the key, M^2, to be jerked out of engagement with the wheel through which the power is being transmitted, and it is necessary to slide the key, N, outwards a short distance before the key, M, can be moved. Both the keys have projections at their other ends which lie above the level of the shaft, L, when they are in place in it. These projections fit into slots which are cut in the rings, M^1, N^1, and enable those rings to slide the keys longitudinally when they are themselves moved along the shaft.

The gear is so made that no screws or bolts of any kind are necessary in order to hold the parts in place. The wheels and the floating rings, P, are slid over the shaft one by one, and are held together by the brasses of the bearings on either side of them; the keys slide in from the end of the shaft, and the rings, M^1 and N^1, are fitted to them at the same time. The pin, N^3, which connects the key, M, with the pivoted portion, M^2, slides freely into place, and is unable to move lengthwise in the key-way. All the gear-wheels run in oil, and the casing enclosing them is made in such a manner that the oil is circulated

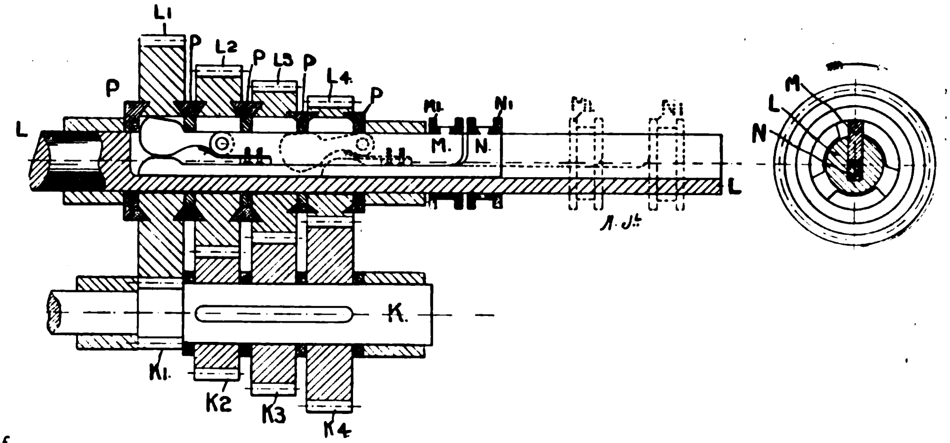


FIG. 11.—Sectional Drawings of First and Second Motion Shafts.

through the bearings by the revolving wheels themselves. It finds its way along channels cut for it in the shaft, and after flowing out into the box, is again thrown up by the revolving wheels. The wheels themselves are unusually large for the power which they have to transmit, and the dimensions of the whole transmission gear, from the engine to the road wheels, is of ample strength for the work which it has to perform. It is seldom that one notices such care as has in this case been taken to calculate the dimensions of the various parts, and it is particularly noticeable that the shafts and other parts gradually get larger and larger, as the speed at which they revolve becomes less, towards the driving wheel end of the transmission system.

The changes from one speed to another are effected in a very ingenious manner, and Bowden wires are employed for sliding the two keys, M and N, in the required manner. The gear is operated from the handle, G^2, which lies to the left of the driver, and projects upward from the floor. The handle is so mounted that it is capable of motion in two directions; it can slide a certain distance up and down, and it can be partly rotated about its own axis. The vertical motion is transmitted to a drum mounted on a horizontal pin, and Bowden wires pass from this drum to the sliding mechanism on the cover of the gear-box. The arrangement of these parts is seen in Figs. 2, 6 and 7, and in Fig. 2 the inner of the four Bowden wires are those which we have just referred to. The two outer Bowden wires are connected to a second drum which is fixed to the base of the vertical hand lever, G^2, and they cause the key, M^2, to slide longitudinally in the shaft, L, when the handle is twisted about its axis.

The sliding mechanism on the cover, G^1, of the gear-box is of very simple construction and is particularly ingenious. It consists of a central rod fitted inside a tube, the tube being free to slide in bearings, and the rod being free to slide inside the tube. Both the tube and the rod carry brackets, G^3 and G^4, at the one end, and these brackets are caused to engage with the sliding rings, M^1 and N^1, by means of pins which engage in their grooves. The pins themselves are tapered and they fit down into holes in the brackets; they are not fixed in place by any screws or nuts, but are prevented from jumping upwards by means of flat springs, which act as catches to hold them in place. The tube surrounding the rod is slotted at about its centre, and a pin projects from the rod through the slot. The pin engages with a sleeve riding on the outside of the tube, and one of the inner Bowden wires is attached to the sleeve. The other inner Bowden wire is attached to the tube itself, and the action of this pair of wires is to cause the rod to slide in the tube, and therefore to separate or to bring together the two grooved rings, M^1 and N^1. One of the outer Bowden wires is fixed to one of the bearings in which the tube slides, and the other outer wire is fixed to the tube. These outer wires, therefore, cause the tube to slide longitudinally in its bearings, but do not interfere in any way with the relative positions of the tube and the rod inside it. It will be understood that when the operating handle, G^2, is raised the rod is caused to slide inside the tube, and the two grooved rings, M^1, and N^1, are then separate, with the result that the locking-key, N, ceases to lock the key-piece, M^2, inside one of the gear-wheels, and that when the handle, G^2, is again pressed downward it will cause the one key to lock the other once more. It will also be recognised that when the handle, G^2, is turned, the tube is caused to slide in its bearings, and therefore both the keys travel longitudinally in the key-way in the second-motion-shaft.

The method adopted for throttling the engine by hand and for admitting cold air to the cylinders when no explosive mixture is required—such as when running down a steep hill—is indicated in Fig. 12. The carburettor, which is of the well known Longuemare pattern, is connected by the pipes, R and R^2, with the inlet valves of the engine. The pipe, R, leads into a valve box, R^1, and the passage through it to the pipe, R^2, is controlled by a valve, S. The rod of this valve is connected through a spring, S^1, by the cord, U^1, and the screw, U^2, with a pivoted drum, U, to which a lever, U^3, is fixed. The drum, U, is also connected by the cord, U^1, to another spring, T^1, which is attached to the spindle of another valve, T. These parts are so arranged that the springs, S^1 and T^1, can normally hold both the valves down on their seats against the suction of the engine. The valve, S, controls the passage of the explosive mixture as already stated, and the valve, T, allows air to be drawn in past it when the spring, T^1, allows it to. The lever, U^3, is connected with a regulating lever (E^5) which lies alongside the steering pillar in front of the driver. By turning this hand-lever the drum, U, can be rotated about its axis, and either the valve, S, or the valve, T, can be allowed to open more or less freely. In this manner the explosive mixture can be throttled to the required extent, a braking effect can be obtained, or the cylinders can be cooled by the admission of pure air.

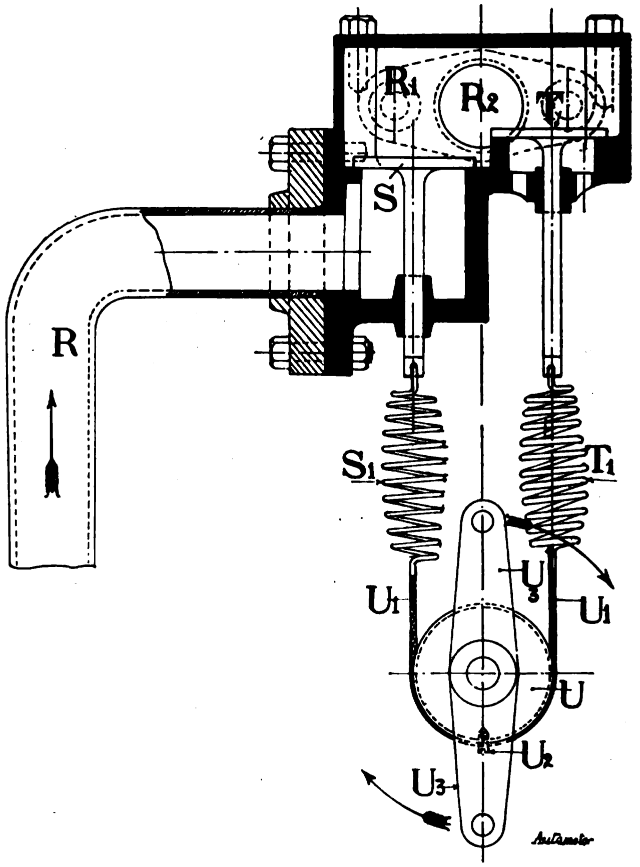


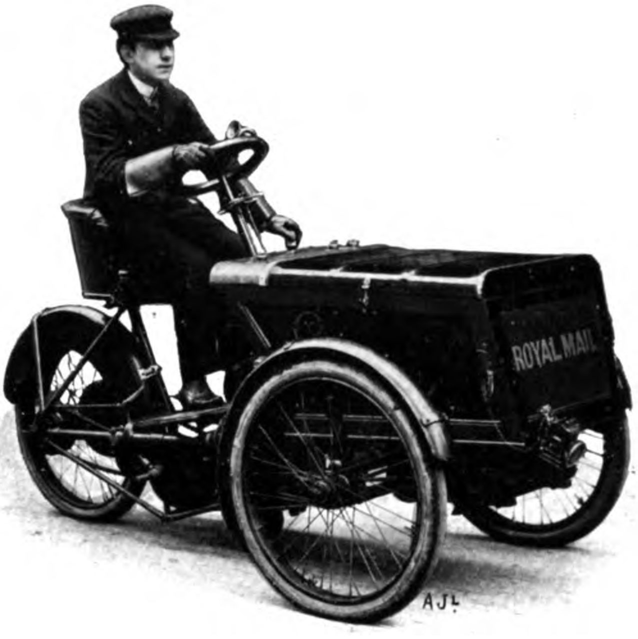
Fig. 12.—Valve Device for Hand-Control of Engine.

In the chassis shown, the inlet valves are held down by an induction pipe fitting, which is secured in place by means of a yoke-piece and a single nut. The pipe fitting is provided with a hinged joint, so that it can be rocked over out of the way when the yoke-piece has been removed. A very quick-acting throttle valve is fitted in the induction pipe, and this is connected with the centrifugal governor. The commutator is mounted on the forward end of the cam-shaft, and the time of ignition is varied by a lever, W, on the dashboard. This hand-lever also operates the main switch, the switch itself being fixed just in front of the dashboard on the end of the spindle to which the lever is attached. The switch comes into play and breaks the electrical circuit as soon as the time of ignition has been retarded to the furthest extent required in practice. The connection between the lever, W, and the commutator, as also the connection between the lever, E^5, and the throttle device, which we have described, are made in such a way that they are unaffected by the movement of the underframe relatively to frame. A foot-accelerator, W^1, is also fitted and is seen in Fig. 8.

The high-tension connections to the ignition plugs are made by means of small metal chains, the lower ends of which are fixed to the plugs, and the upper ends are attached to narrow strips of thin sheet brass, which project from the induction coils, and form tapered spring hooks for the chains to hang from. The employment of chains for this purpose gives the necessary external spark gaps which have been found so useful in connection with high tension electric systems. The chains are quite slack, and the links are in constant motion about one another. At night they appear quite luminous.

In addition to the foot-brake, double-acting brakes are also fitted to the hubs of the rear wheels; they are compensated by means of a cross-beam, from the centre of which a steel rope, Q^1, passes forward to the brake lever, Q, in the centre of the dash. These brakes are applied by drawing the lever, Q, towards the driver, and the lever itself is completely out of the way in the position in which it is placed.

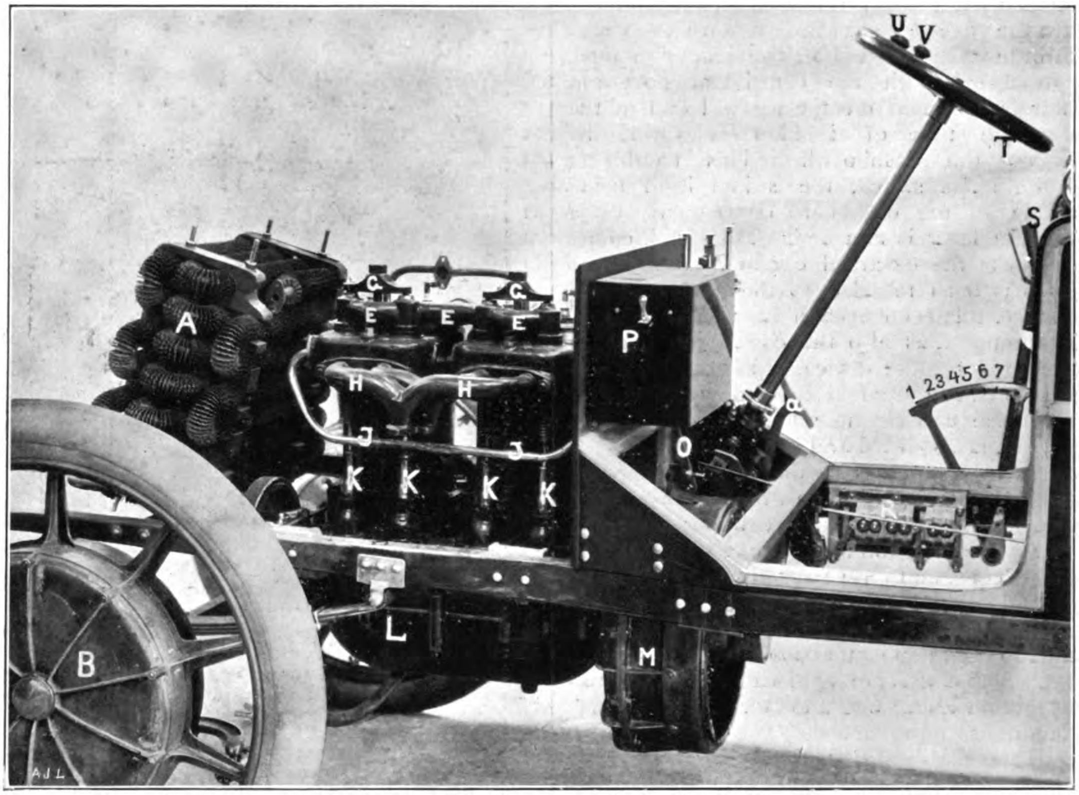
A peculiar feature of the car is that all the levers are arranged so as to be worked by the left hand instead of the right, as in most vehicles, and that the right hand is therefore used almost exclusively for steering. The arrangement of the water tank and the radiators is such that natural circulation is maintained in the event of the pump failing to act properly; the pump being of the centrifugal type there is a clear passage through it for the water to pass, even if it is at rest. The weight of the car is about 20 cwt., and the makers point out that solid rubber tyres can safely be used instead of pneumatics in consequence of the special method of suspension which they have adopted. It will be noticed that tyres of this kind are fitted to the chassis shown in our illustrations, although pneumatic tyres are provided on the complete car shown. In conclusion, we would draw attention to the fact that the clearance between the car and the road is about 7½ inches, and that in this respect appearances are deceptive; the arrangement of the underframe beneath the axles gives the impression that the clearance is considerably less than this, and it is for this reason that we refer to this anomaly. The Langdon-Davies Motor Company, Limited, whose works are at 101, Southwark Street, S.E., are to be congratulated on the enterprising manner in which they have developed, the "Soames" Car, and upon the undoubted engineering skill which they have brought to bear upon the automobile problem.



We give above an illustration of the new motor parcel tricycles which are being used by the London Post Office authorities for the rapid transit of letters and parcels in the metropolitan area. These little carriers are built by the Eagle Engineering and Motor Company, Limited, of Altrincham, Cheshire, and are fitted with 4½-h.p. water-cooled De Dion engines. The length of the carrier over all is 8 ft. 3 ins.; width, 3 ft. 7 ins.; length of wheel base, 5 ft. 4 ins.; width of track, 3 ft. 1 in. The inside measurement of the carrier body is 2 ft. 7 ins. long by 1 ft. 10½ ins. wide by 1 ft. 8 ins. deep, the carrier being capable of carrying a weight of 5 cwt. The back part of the carrier body also forms the tanks for the petrol, oil, and water, all of which are in easy reach of and in front of the driver. Two band brakes are fitted to drums on the driving wheel and are applied by means of two foot pedals.

A PROTEST has been made to the Scottish railway companies by the Scottish Automobile Club against the unfair charges made by them for the conveyance of motor cars. These charges at present appear to be uniform, which renders them specially hard upon owners of small types of cars. A car costing £150 pays the same in carriage as a car costing £1,500 and weighing possibly three or four times as much. By way of contrast, the Scotch Club point out that the cost of conveying a car from Paris to Edinburgh by rail to Dunkirk and by ship thence to Leith costs £3 for a small one, and £5 for a large one. Freight by sea from London to Leith, of a small car, is only 14*s.*, whereas any size sent by rail from London to Edinburgh costs about £10. From Paris to Boulogne (160 miles) the French charge by rail is only 27*s.*, and by the same route a car weighing over 1½ tons can be brought from Paris to Edinburgh at a cost of under £10. By way of argument in favour of modifying their charges, the Scotch Club point out that there are many occasions when, on account of weather, condition of roads, early starts or long distances, automobilists would find it convenient, if inducements were offered them, to make a more general use of the railways for the transport of their cars of themselves, and of their friends.

A 15-H.P. LOHNER-PORSCHE PETROL-ELECTRIC CAR.



The new 15-h.p. Lohner-Porsche Petrol-Electric Car.

The front portion of the latest Lohner-Porsche Petrol-Electric carriage, is shown in our illustration, and it will be noticed from the particulars which we are able to give that, although the original system has been adhered to, the details of construction have recently undergone a considerable amount of modification and development.

The engine is a 15-h.p. Panhard "Centaure," and is fitted with a Krebs carburettor. It is of the 4-cylinder type, and is fixed to the main frame. Two independent commutators are provided, and the high-tension ignition plugs for the cylinders are in duplicate. The engine is coupled direct to the armature of a dynamo, M, the armature replacing the usual flywheel and running inside a circular field magnet casting, which is more or less secured to the main frame. The field magnets are not exactly fixed to the frame, because they are capable of a slight rotary motion through a few degrees. They are normally held in this respect up against a stop by means of a spring, and they can only overcome the pull of the spring when the load upon the dynamo exceeds a certain amount. The actual position of the field magnets therefore varies in accordance with the load, and they are connected in such a manner with the engine that they replace the ordinary centrifugal governor, and control the power developed by it.

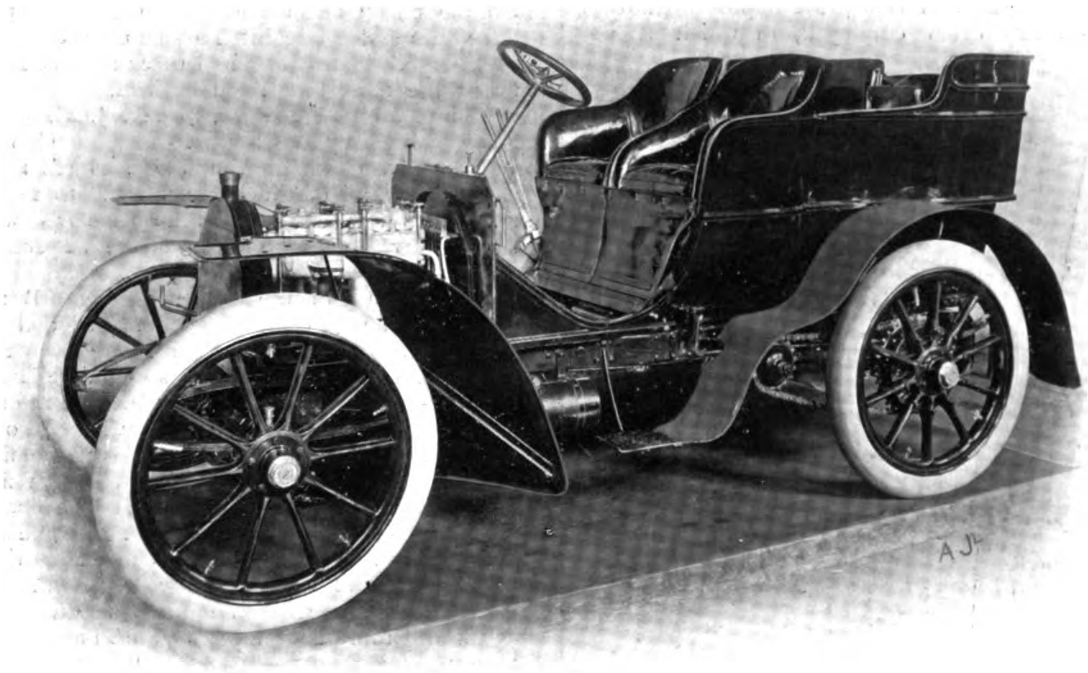
The power is transmitted to the front wheels electrically, each of these wheels being of the latest Lohner-Porsche pattern, in which the motors are enclosed in the hubs. The speed of the vehicle is varied by means of the hand-lever, S, which is connected with the controller, R, in such a manner as to complete the required electrical connections between the dynamo and the motors as it is moved to the different positions about its quadrant.

A small battery of accumulators, consisting of six cells only, is provided on the car. They are used primarily for the ignition, and are also employed for starting the engine by means of the dynamo, and for the lamps. The cells can be re-charged from the dynamo when necessary.

The electrical connections made by the controller enable the motors in the wheels to be used as powerful brakes, and the mechanical brakes which are applied to the hubs of the rear wheels are arranged in such a manner as to be brought into operation simultaneously with them. The weight of the vehicle is about 16 cwt., and it is said to be capable of attaining a speed of nearly 50 miles an hour on the level.

Legal trouble is brewing between Mr. Frederick R. Simms, Chairman of the Simms Manufacturing Company, Limited, and the Automobile Mutual Protection Association, in connection with the Simms-Bosch Magneto Electric Ignition. The cause of action, we are informed, is on account of the Association having, it is stated, circularised the British automobile manufacturers and traders advising them to resist any claims for royalty in connection with the Simms-Bosch ignition.

THE 1903 18-22-H.P. MERCEDES.



The first to obtain delivery in England of one of the new 18-h.p. 1903 Mercedes cars was Mr. J. E. Hutton, of 23, Regent Street, and although it did not arrive at Islington until nearly the end of last week, yet it formed the chief attraction of the last day or two at the Exhibition.

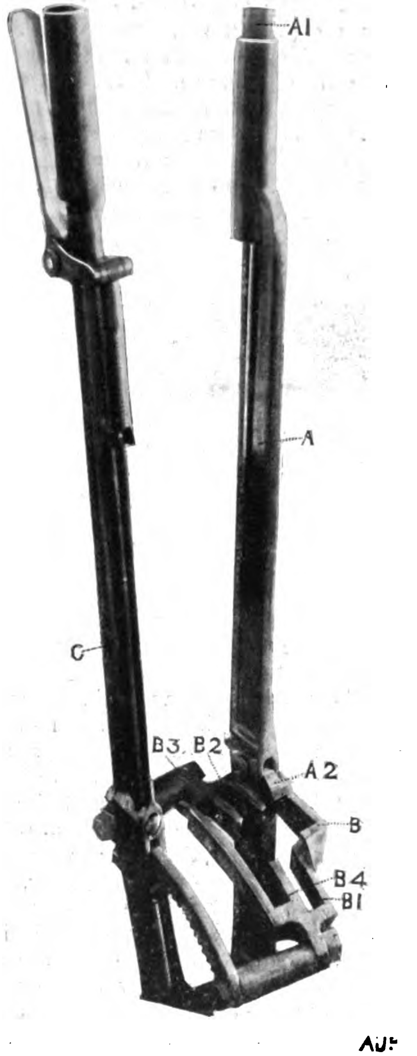
We have already described and illustrated this new model so thoroughly, both in our issues of January 24th and of March 14th last, that it is unnecessary for us to go over the same ground again. There are, however, certain features which we have not been able to describe very fully previously, and there are certain particulars in which Mr. Hutton's car differs from the description which we received from Germany.

The method adopted for regulating by hand the quantity of explosive mixture which is drawn into the cylinders consists of a device by which the mechanically operated inlet-valves are opened to a lesser or a greater extent, and are consequently opened and closed earlier or later during the suction stroke. We have already mentioned that the inlet-valves are arranged in the heads of the cylinders, and that they are operated by cams on the cam-shaft. The movement is transmitted to them through vertical rods which screw into the ends of pivoted levers, the other ends of which press upon the heads of the valve spindles. These vertical rods are provided with small toothed pinions, which are in mesh with a rack engaging with all four of them. The rack can be moved longitudinally by hand, and then causes the rods to rotate and to screw themselves into, or partly out of, the sockets at their heads which engage with the pivoted levers. When these rods are in this manner lengthened to their greatest extent, they open the valves, and allow them to close at the usual time in the cycles of operation. When, however, they are shortened, they allow a variable amount of idle movement between the cams and the valves, thus giving the desired effect. When the rods are shortened to the greatest extent provided for, the inlet-valves remain closed.

The main clutch is of the expanding type, although it differs considerably from that illustrated by us on page 83 of this volume. The expanding portion of it is operated by a sliding cone, which is moved along the shaft by a spring, and against which the lever arm, expanding the inner portion of the clutch, presses. The cone has an almost spherical surface, and is, of course, withdrawn by the foot pedal. An intermediate piece of shaft is inserted with flange couplings between the clutch and the first-motion gear-shaft.

The countershaft brake is so arranged as to be water-cooled, and one of the levers connecting it with the foot-pedal is arranged in such a manner as to automatically open a valve through which the water passes to the drum, when the pedal is depressed. A cock on the dash also controls the water-feed to the valve and the drum.

One of the most pleasing arrangements on the car is shown in our illustration. The change-speed lever, A, can be moved into either of the slots, B^1, B^2, B^3, or B^4, in the quadrant, B,—to give the first, second, third, and fourth speeds respectively—and it has to be put in the position shown in order to give the reverse. The quadrant is so shaped that the lever cannot be removed into the "reverse" slot until the catch, A^2, has been raised by depressing the push rod, A^2, which is fitted on the handle portion of it. The catch is not raised for changing from one speed to another, and, so long as it remains in its normal position, it is impossible for the "reverse" to be brought into use. This ingenious arrangement has been very neatly carried out, and is a great improvement over the previous safety catch employed, in which it was necessary for the driver to stoop down to the quadrant in order to remove it. The lever, C, which operates the side-brakes, does not differ from ordinary practice. The side-brakes are of the internal expanding type.



The Change-Speed and Brake Levers.

The sprocket wheels on the counter-shaft have no spokes between the hub and the rim, the web between these parts being continuous. The radius rods connecting the frame with the back axle are particularly strong, and are constructed with an I section.

This particular machine has been sold to Mr. H. W. Spiller, of London, but we hear that Mr. Hutton has been fortunate enough to receive a second car from the Cannstatt works during the last day or two.

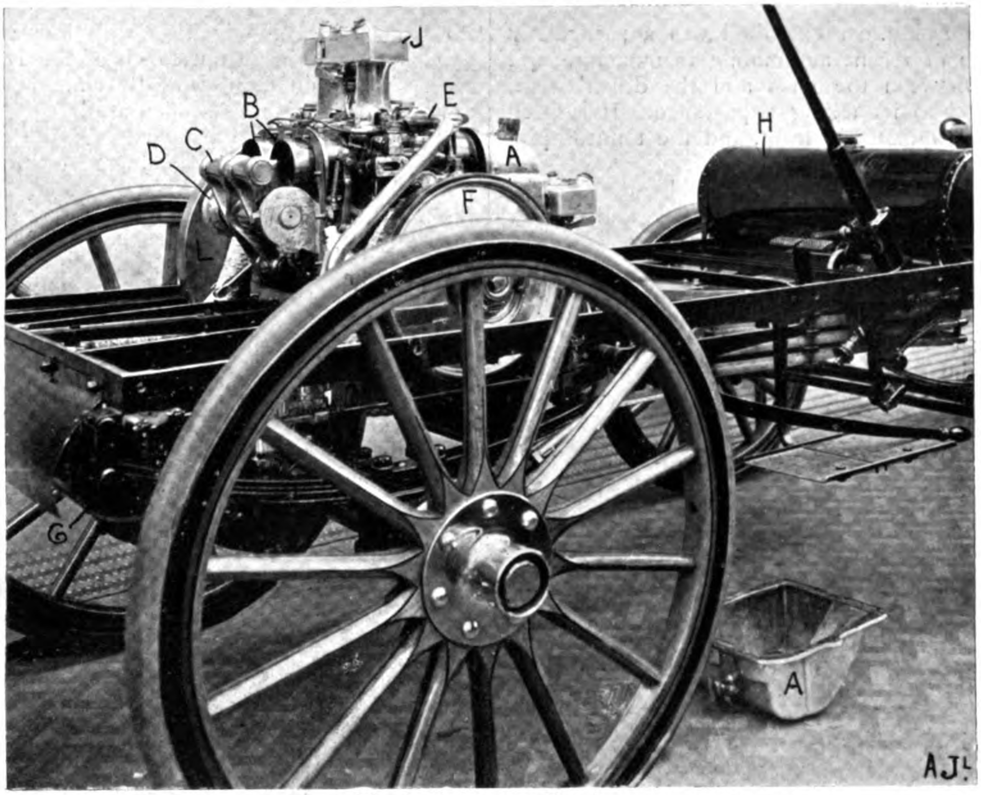
THE ANNUAL AGRICULTURAL HALL EXHIBITION.—

Part II.

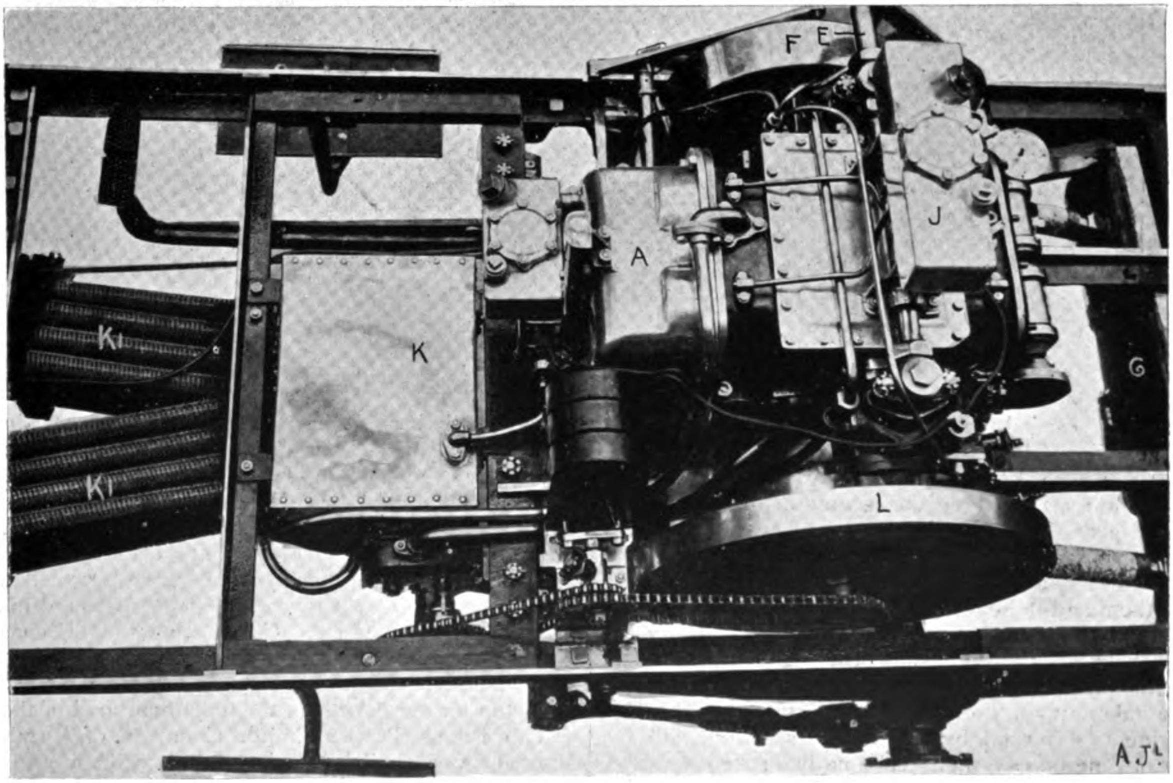
The interest taken in the Exhibition was well maintained to the end, and not a few of the exhibitors and others upon whom the onus of these shows largely rests did not disguise their satisfaction as the time drew near for the closing of the last of the long series of Exhibitions which have this season replaced the single one hitherto patronised by the Automobile Club. A few of the late arrivals were in reality amongst the most interesting exhibits. We refer to the new 18-h.p. Mercedes, shown by Mr. J. E. Hutton, the racing car built by the Star Engineering Company and owned by Mr. Cordingley, and Mr. Hart's new petrol-electric vehicle, all of which are referred to separately in our columns this week. Mr. Cordingley's well-known Mercedes was also put on view for the inspection of the visitors in the middle of the large Hall.

We have already mentioned the majority of British petrol vehicles which were on view. Others included the latest Argyle models of the Hozier Engineering Company, which consisted of a light car fitted with a 9-h.p. De Dion engine, and a two-cylinder vehicle having a Clement or an Aster engine. A chassis of the latter type with one of the new Aster engines, and having a fan-cooled honeycomb radiator, instead of their own natural circulation system fitted to it, was a prominent feature of the stall. The change-speed gearing, which gives three forward speeds and a reverse, had the cover removed, so that its ingenious design and arrangement could be thoroughly examined. A direct through drive is obtained on the top speed, and the jaw-clutches which introduce the gears are connected with the change-speed lever through springs in such a manner that it is impossible for the driver to strain the mechanism, even if the clutch jaws are not in line with one another at the moment when he operates the lever. The lever can be moved either forwards or backwards in the quadrant, and for the other forward speeds is moved outwards away from the body. The slot in the quadrant is for this purpose T-shaped. The Argyle vehicles are well and strongly built, and the Company are doing such a very large business with them that they are again largely extending their works.

Another particularly neat change-speed-gear was shown fitted to the New Orleans Company's 15-h.p. car. The chief feature of the mechanism, in addition to its compactness, being that a direct through drive is obtained, and that the lay-shaft is at rest when on the top speed. A single lever is employed for giving the four forwards speeds and for the reverse, it being moved either forward or backwards in either one or other of two slots in the quadrant, and being introduced into a third parallel slot for the reverse; a safety catch prevents the reverse gear from being thrown in unintentionally. The gear-box is self-lubricating, and the lay-shaft consists of a sleeve which revolves upon a fixed spindle. It is difficult to describe the arrangement of the gear with any clearness without reference to drawings, and these are at present unobtainable. It is, however, one of the best designed for use with a live rear axle which we have seen, and will be referred to again by us in due course. The rear axles of these cars are now made in such a manner that the weight of the vehicle is taken upon the stationary portion, and not upon the live part, of the axle. The driving bevel wheel can also be removed without disturbing the casing enclosing the differential gear, and the whole construction has been considerably improved. The entire axle is lubricated by oil pipes which lead from the



The Arrol-Johnston Chassis.



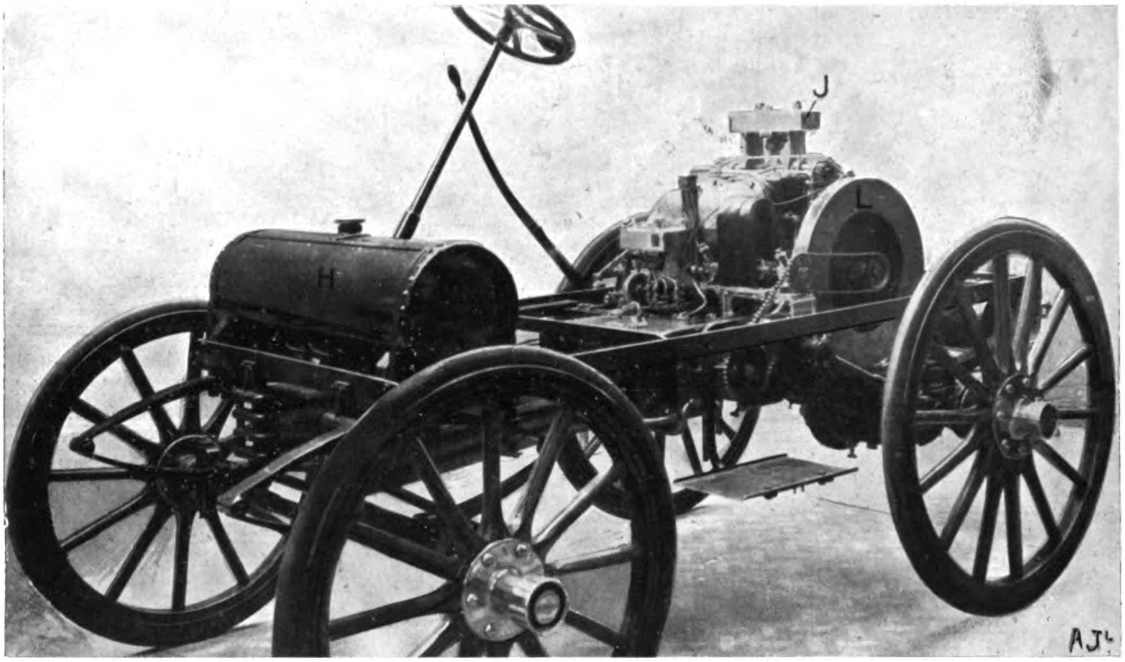
Plan View of Arrol-Johnston Chassis.

A, casing fitting over the ends of the cylinder.
B, pistons.
C, ends of piston rods.
D, rocker between piston rods and connecting rod.
E, induction pipe.
F, main clutch.
G, exhaust box.
H, petrol tank.
J, wick lubricator.
K, water tank.
K^1, radiator.
L, flywheel.

dashboard. The 15-h.p. car exhibited was a particularly attractive example of recent automobile manufacture, and the side doors, between the dash and the driver's seat, added considerably to its taking appearance. It is fitted with a honeycomb radiator in front, and the tonneau provides three seats for the passengers.

One of the Arrol-Johnston cars made by the Mo-Car Syndicate, of Paisley, was illustrated last week, and we now give three different views of the chassis. The construction adopted throughout is original; we referred to the arrangement of the cylinders and the crank shaft last week. The main clutch is fitted on one end of the crank shaft, and the flywheel on the other. The gearing is enclosed in a casing beneath the engine, and it is of the sliding spur-wheel type. The first-motion-shaft is driven by a chain from the engine, and the second-motion-shaft is connected by a second silent Renold chain to a small lay-shaft carried upon the back axle. The lay-shaft is geared to the differential on the live axle by spur-gearing, the wheels being entirely enclosed. The sliding spur-wheels are arranged on the second-motion-shaft, and the reverse gear is obtained by means of an intermediate spur-wheel. The four forward speeds and the reverse are all operated by a single side lever, the connection between them and it being made by means of three cams. The rear wheels run on ball bearings, which are introduced between the hubs and the steel tubes which enclose the live axle; the weight of the vehicle is therefore taken upon the stationary portion of the axle. The engine is governed by a hit-and-miss action, and by an ingenious inertia governor. The normal speed is varied by a special form of accelerator, which is operated by turning round the handle of the change-speed-lever. The governor is so arranged that it cuts out one cylinder before the other, and it is unusually sensitive for a governor of this type. Magneto ignition with low-tension igniters is employed, and the carburettor is of the Daimler float-feed type. The main frame is neatly constructed and is for the most part made from T section steel.

The two cranks are arranged opposite to one another; the two forward pistons are connected with the one crank-pin and the two rearward with the other. The majority of the moving parts in the engine are lubricated from a small force pump, and are constructed with passages running through them to their bearings for this purpose. All the moving parts are enclosed in neat casings. A wick lubricator is mounted above the cylinders, and four separate pipes lead from it to the pistons. The engine is started by means of a wooden handle fixed to the end of a rope passing round a pulley beneath the dash in such a manner that the driver can haul it up towards him from the seat. The mechanism is normally out of engagement with the crank-shaft and is automatically brought into gear with it when starting only. The Company make their own steel castings and manufacture practically every portion of the car themselves. It is built somewhat high, and is usually fitted with solid rubber tyres, being specially suited for all-round work in Scotland, where the snow in winter frequently lies at a considerable depth on the roads. An exceptionally large range is provided in the steering gear so that it is possible to turn round in a comparatively narrow street. Considering the high centre of gravity we were forcibly struck with the stability of the vehicle under the severe tests which were made by Mr. Johnston for our benefit in the neighbourhood of the Hall.

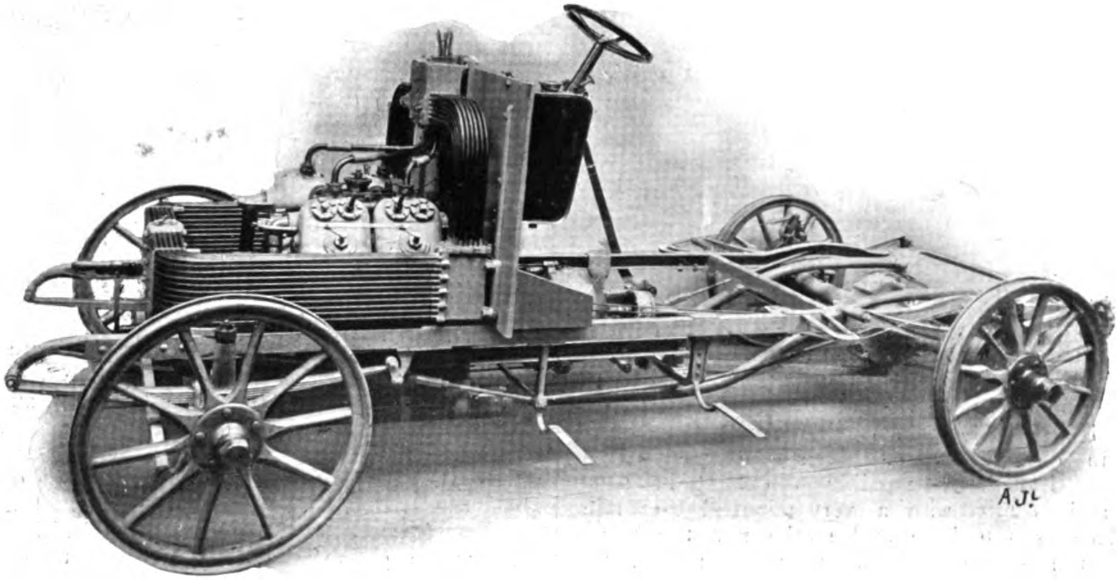


The Arrol-Johnston Chassis.

The British Peerless Motor Company, of Birmingham, showed a very similar chassis to that which we described and illustrated in connection with the Automobile Club Show last year, at which time the makers were the Automobile Supply Company. A tubular frame is employed, and the car is of the live-axle type, driven by an 8-h.p.

single-cylinder engine. The levers operating the change-speed-gear and the side-brakes work in quadrants fixed to the steering pillar, and wire wheels with pneumatic tyres are used.

The Holcar, which is shown by the United Kingdom Inventions Association, and is the invention of Mr. Holroyd Smith, differs radically both from other cars now upon the market and from previous vehicles shown by him. A view of the chassis which was exhibited is seen in our illustration, where it will be noticed that it is built considerably more in accordance with modern practice than were Mr. Smith's previous productions. The engine has four cylinders which are cast separately and are arranged in pairs on each side of the crank-chamber, at an angle of 45 degrees from the vertical. The cylinders on the one side are opposite those on the other, and a two-throw crank, with the crank-pins at 180 degrees from one another, are employed. The radiator consists of a large number of thin tubes, which form the bottom of the bonnet, and also pass over it in front of the dash. The power is transmitted to the gear-box through a special form of clutch, in which a double grip is obtained, and which normally imposes no end thrust on the moving parts. The clutch is so arranged, in conjunction with a brake, that the latter is applied by the same action after the clutch has been disengaged. The change-gear gives two forward speeds and a reverse operated by a single lever; a direct drive on the top speed is secured, and what gear-wheels there are are always in mesh; there is no lay-shaft. A universally-jointed shaft connects the gearing with a live rear axle, and a central radius rod is used. The engine develops about 20-h.p. at 900 revs. per minute, and the power is regulated by four inter-connected throttle-valves, one for each cylinder. A centrifugal governor is provided, and it is mounted on a separate shaft. The steering pillar is arranged so that its angle with the frame can be varied at will, and that it can be moved up out of the way to enable the driver to get in and out; the steering-gear is so designed that this motion of the steering-pillar has practically no effect upon the steering.



Chassis of the "Holcar."

Reynold Jackson and Company, of Albert Gate Mansions, S.W., showed several new types of light petrol cars which they have put upon the market, including their 3-h.p. and 6-h.p. "Covert" cars, their 10-h.p. "Buckmobile" and two 8-h.p. vehicles. The smaller covert car has a tubular underframe, which connects the rear axle with the centre of the front axle. The engine is of the single-cylinder vertical type, and is fixed near the rear axle. The power is taken from it to a countershaft on the underframe, from which it is led alternatively through either of two chains, back to the differential on the live axle. One of the larger cars of American construction, known as the "Century," has an attractive appearance, and in general arrangement is typically American. The change-speed-gear is of the epicyclic order, and tiller steering is used.

The Clarendon Motor Company showed one of their light petrol vehicles, and also had on view an entirely novel engine which is intended for use with kerosene instead of petrol, and is built on original principles. It has two working cylinders and a pump cylinder, all three being arranged vertically side by side on the crank chamber. The makers are not prepared, however, for the time being, to give full particulars of their system, and we must, therefore, defer further reference to it till a later date. The Motor Vehicle Engineering Company, of Chelsea, showed one of their 10-h p. "Grand" cars, and a 10-h.p. chassis. Their machines follow very closely on the well-known Panhard lines. The Company also exhibited the "Helsby" system of helical-cored, lead-sheathed, earthed cable wiring. The two Beckett and Farlow cars, which we described in connection with the Earl's Court Show, were again on view.

(*To be continued.*)

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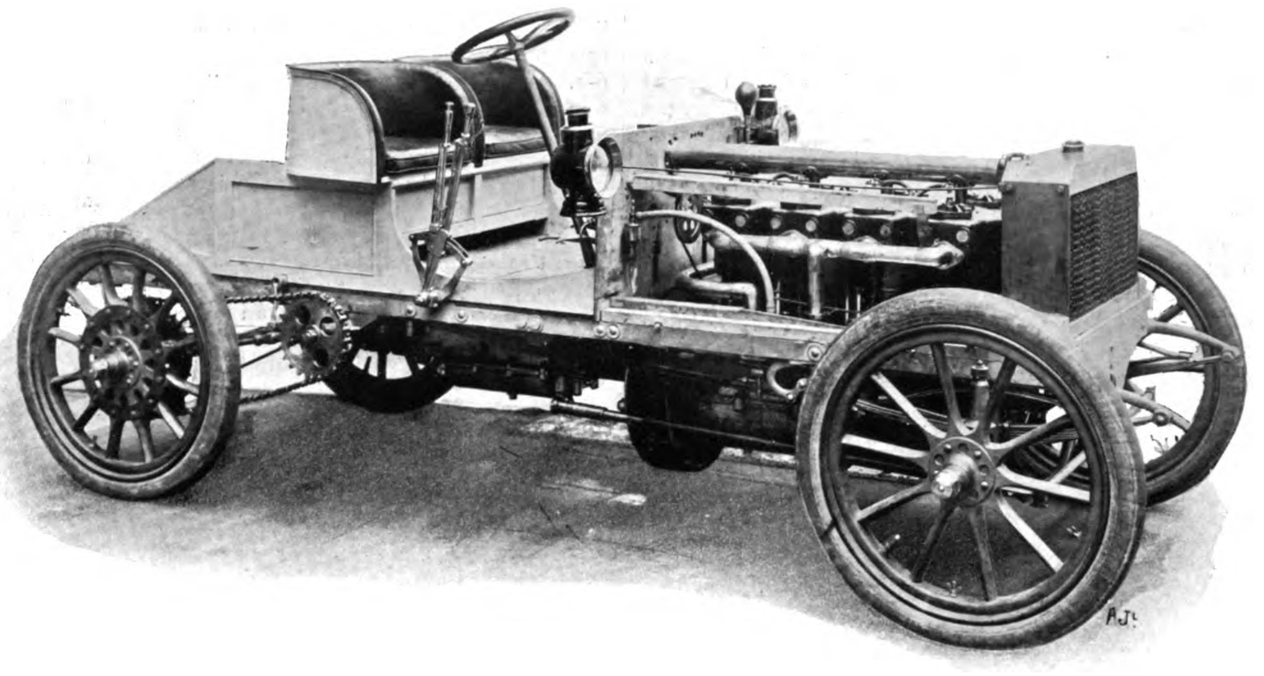
Messrs. Weller Brothers announce that they are building an 80-h.p. racer for the Gordon-Bennett Cup Race for 1904. This is looking ahead indeed.

THE STAR RACING CAR.



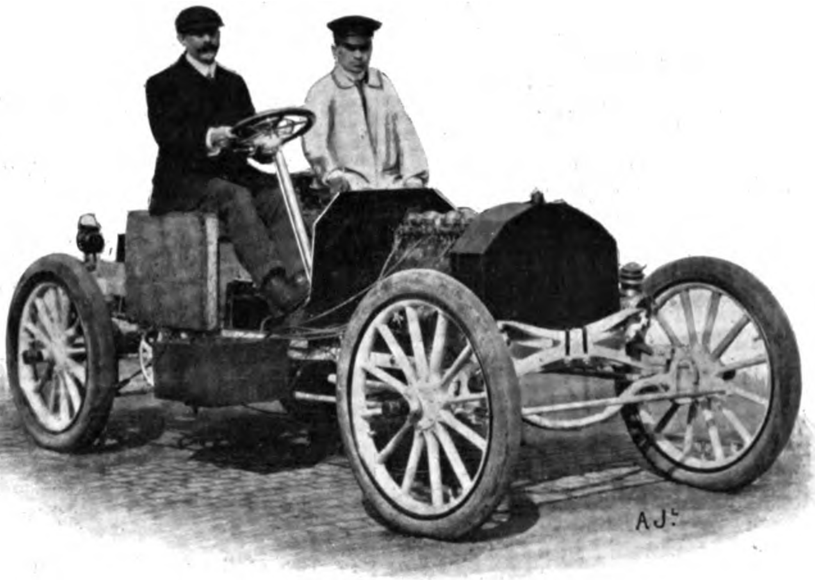
The Star Company's Racing Car.

MR. CORDINGLEY'S Star racer, which is to take part in the eliminating trials preliminary to the Gordon-Bennett Cup Race, and which was on view at the Exhibition at the Agricultural Hall last week, is shown with the bonnet removed in our illustration. It is of extremely light construction throughout—possibly too light in some respects—and is fitted with a very powerful 4-cylinder engine. Neither the bore and stroke nor the horse-power of the engine have been made public, but it is safe to assume that it is capable of developing about 75-b.h.p. at a reasonable speed. The general arrangement of the machinery follows ordinary practice, and side chains are employed for driving the rear wheels. A very large main clutch is fitted, and the first-motion-shaft is arranged beneath the second-motion-shaft in the gear-box. Three forward speeds and a reverse are available, and these are operated by a single side-lever. The centre of gravity of the engine has been kept low, and a single carburettor is used for all four cylinders. A honey-comb radiator forms the front of the bonnet, and a pipe of large diameter passes from the top of it across above the engine, and through the dash. Branch pipes lead from it down to each of the jackets, and its rear end is fitted with a glass window, which enables the driver to see if the water is circulating properly. The main frame is built up of wood and steel, and the front springs are reinforced with double elliptic springs of small size.

"The Buffalo" suggests itself as being a suitable name for this racer, as it has a large and powerful head, and tails away to very light hindquarters.

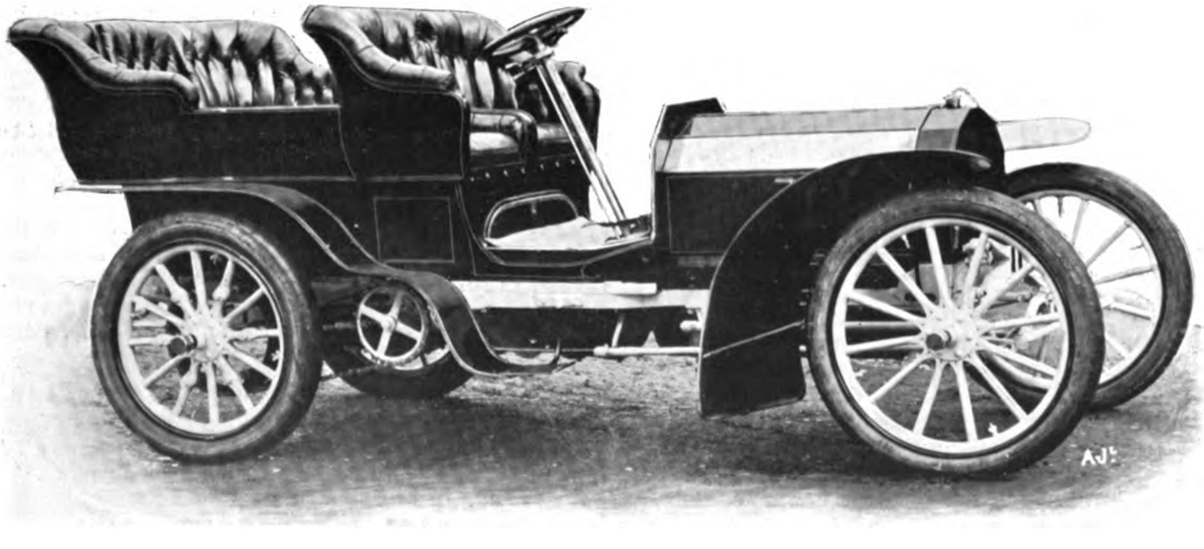
Mr. Mark Mayhew and the Cabman.—We have become so accustomed to motorists appearing in police courts in the vicinity of the dock that it is pleasantly refreshing to find the circumstances for once reversed, and a motorist successfully prosecuting that least pleasant of London's hardy annuals, the abusive cabman. It is not many years ago since one of the principal obstacles to a motor car's progress through the Metropolis, next perhaps to the tramcars and 'buses, was the running commentary of what was supposed to be humour that was showered upon them from the back seats of hansom cabs. There is little of this form of banter audible now, and the cabbies have returned to exercising what passes for their wit on their colleagues and their hereditary enemies, the 'bus drivers and conductors. A relic of this barbarous age was, however, encountered recently by Mr. Mark Mayhew on the Embankment. He was driving his car along that thoroughfare when he overtook a hansom cab which was proceeding on the wrong side of the road. Mr. Mayhew blew his horn, and this acted as a signal for a discharge on the part of the cabman of a torrent of "language," which was subsequently described in court as "disgusting." After delivering his fusilade the cabman, as is customary on these occasions, attempted to escape, but he had a motor car to deal with, and escape was not so easy. Mr. Mayhew turned his car across him, brought him to a standstill, and had his name taken by a constable. Mr. Mayhew's prosecution had the satisfactory result that a fine of 40*s.* (the maximum penalty) and costs was inflicted upon the vituperative cabman.

THE 40-H.P. HART PETROL-ELECTRIC CAR.



The Hart Petrol-Electric Chassis, with rough Trial Seat, Mr. E. W. Hart at the Wheel.

THE interesting vehicle which has been built by Mr. E. W. Hart, and in which an electrical transmission system is substituted for the ordinary mechanical change-speed-gear, is shown in our illustrations. In one of these, the chassis had been hastily equipped with a rough seat in order to give it a trial spin in Regent's Park before the final body was fitted in place in readiness for the Exhibition; in this illustration Mr. Hart himself is driving. The main frame, which is built up of channel steel filled with wood, is supported upon semi-elliptic side springs above the rear axle, and upon the transverse springs, which are clearly seen in our illustration, above the front axle; the rear springs are of somewhat curious shape, and are longer in front of the axle than behind it. The side members of the frame are stiffened by tie-rods passing along beneath them, and giving them a girder construction. The usual distance rods connect the back axle with the frame, and similar rods are employed for keeping



40-h.p. Hart Petrol-Electric Car.

the front axle parallel with the other. These rods are pivoted to the ends of the axle, close up to the forks which provide the steering heads, and at their other ends they are pivotally fixed to the side members of the frame, a little forward of the dashboard. The engine is of the 4-cylinder type, and is capable of developing about 40-h.p. It is fixed to the main frame, and has its inlet valves arranged above the exhaust valves. The inlet valves are mechanically operated from an enclosed cam-shaft which passes across above them, and is driven by a chain from the engine. The front end of this cam-shaft has a pulley wheel secured to it, by which it drives a fan placed immediately behind the honeycomb radiator forming the front of the bonnet. The engine is fitted with a centrifugal governor, connected with the throttle valve; the normal speed is regulated by a hand-lever mounted above the steering wheel. High tension ignition is employed, and the timing of it is effected from a small lever on the steering pillar. Another similar lever alongside it is connected to the carburettor.

A 20-kilowatt dynamo is fixed to an angle underframe, immediately behind the engine, and its shaft is connected with the crank-shaft by a flexible coupling. The dynamo is of the enclosed 4-pole pattern, and has been specially constructed with a view to reducing its weight as far as possible. The current generated by it is led through a controller to an electric motor, which is fixed to the main frame immediately behind the differential countershaft, from which the side chains pass to the rear wheels. The shaft of this motor lies parallel with the countershaft, and a spur-wheel on its left end meshes with a corresponding spur-wheel secured to the shell of the differential. The controller connects the dynamo with the motor and with resistance coils in such a manner that the speed of the car can be regulated at will. The controller is operated by a horizontal lever, which is fixed to the steering pillar beneath the wheel.

The usual side brakes are fitted to the hubs of the rear wheels, and a brake-drum is also fixed on the right end of the electric-motor shaft.

The machine has already shown itself capable of attaining very high speeds, and may not only be expected to give a good account of itself but also to enable valuable data concerning this method of transmission to be obtained.

TRIALS AND RACES.

THE NICE WEEK.

The arrival of the competitors, on March 27th, in the Paris-Nice Heavy Vehicle Trial, instituted by *La France Automobile*, was the formal inauguration of the commencement of the Nice automobile week. Unfortunately, the number of starters in this trial was very small, viz., three, of which two only arrived at their destination, viz., the De Dietrich and the Serpollet omnibuses, both of them being in good time. The weather and roads throughout the journey had been fearful, and it is therefore highly creditable that under the trying circumstances they should have got through without any mishaps, considering the fearful strain which the continuous travelling subjected them to.

On arrival at Nice the weather was no better, and on the 28th it was decided, in consequence, to postpone the Brake Competition until the 4th instant. On Sunday the success of the fête fleuri was considerably marred by the miserable and sunless weather, in spite of which, however, a good number of exquisitely decorated cars competed for the prize banners, the first award falling to Mr. Warden, an American, who drove a Panhard car. Amongst those who were present early on the scene were Count Zborowski, Mr. Alfred Harmsworth, and Mr. Claude Johnson.

Both the two days' big tour and the little tour for cars were run off on the 30th and 31st—the longer tour comprising for the first day 257 kiloms., and the second day 300 kiloms., the shorter tour being, first day, 128 kiloms., second day 200 kiloms. The former tour was arranged for two categories, viz.—(*a*) 1 and 2-cylinder cars, for which there were 10 entries, and (*b*) cars with 3 cylinders and upwards, for which there were 16 entries. For the shorter tour 7 cars entered.

The vehicles in both tours started each day between 5 and 8 a.m. in magnificent weather. In the "Grand" tour 12 vehicles were timed away on the first day, viz.:—

Stead (De Dietrich), Prince Lubecki (Mercedes), Garin (Rochet-Schneider), Thorand (Gladiator), Marconnet (Rochet-Schneider), Desjoyeaux (Renault), Jolliot (Rochet-Schneider), Petley (Germain), Rouff (Rochet-Schneider), Jack (Mercedes), Sportsman (Mors), Blanc (De Dion).

Of these all arrived back in good time at Nice with the exception of MM. Jack and Blanc, both of whom had trouble with their wheels. MM. Thorand and Sportsman were disqualified as they took upwards of 45 mins. to surmount the Braus Hill, a distance of 11 kilometres. The following are the times of the other competitors in surmounting this mountain pass:—

*Stead, 24 mins.; 15 mins.; *Lubecki, 18 mins.; 11 mins.; *Garin, 26 mins.; 18 mins.; Marconnet, 27 mins.; *Desjoyeaux, 38 mins.; 27 mins.; *Jolliot, 25 mins.; 15 mins.; Thorand, 1 hour; Blanc, 27 mins.; Petley, 35 mins.; *Rouff, 30 mins.; 19 mins.; Jack, 25 mins.; Sportsman, 52 mins.

Those with an asterisk started and returned on the second day, and, therefore, obtain a diploma. The second times given against those names are the respective times taken in surmounting the Saint-Vallier hill on the second journey.

The special prizes for the best combined hill-climbing times go to:—1st, Prince Lubecki; 2nd, Stead; and 3rd, Jolliott.

The starters for the "Petit" tour were:—

MM. Bourdin (Panhard), Bourdon (Panhard), *Guidi (Renault), *Liégeard (Peugeot), *Serraire (Serpollet), *Dumas (Rochet-Schneider), Barbre (Bardon), *Evans (Mors), *Canet (Panhard), *Johnston (Mercedes).

All returned safely and in good time to Nice on the first day except M. Bourdon, who suffered from a similar accident to MM. Jack and Blanc in the longer tour. An asterisk denotes those who started and completed the course on the second day and who received diplomas.

The Turbie Hill-climb commenced on Wednesday under very auspicious climatic conditions, the number of entered cars—57—of which 32 were ready to start, promising some excellent sport. Unfortunately the meeting was brought to an abrupt close by a deplorable accident. Count Zborowski, one of our most popular and daring automobilists and sportsmen, in his natural desire to win this classic event, was over-hazardous in taking one of the fiercest corners—only a few hundred yards from the start and at the same spot where Bauer, in 1900, met his death—

at too high a speed, with the result that he was dashed against the rocks, with fatal consequences to himself and his "chauffeur," Baron de Pallange. The awful catastrophe was rightly deemed to justify the rest of the meeting being at once abandoned. Count Zborowski's untimely death at 40 will be felt keenly, both by reason of his great popularity in automobile circles, and from the fact that he was one of the proposed drivers on behalf of England in the Gordon-Bennett Race. The Baron, who drove a 60-h.p. Mercedes, was fourth starter. The previous starters—who all drove cars of the same make, in the order shewn—and their times were:—M. Hieronimus, 14 mins. 26 secs. (*record*—previous bests, 15 mins. 46 secs. by Gabriel on a Darracq, and Stead, 16 mins. $37\frac{3}{5}$ secs. on a Mercedes); Werner, 14 mins. $45\frac{4}{5}$ secs.; and Degrais, 16 mins. $56\frac{2}{5}$ secs.

Entries for the Glasgow to London two days' Non-Stop Trial (May 13th and 14th), particulars of which have already been published in our columns, will close on the 13th instant. Conditions and entry forms may be obtained from the Secretary of the Scottish Club (Western Section), 59, St. Vincent Street, Glasgow

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Some of the events in connection with the Aix-les-Bains Automobile Meeting have been modified, and the programme, as now announced, is as follows:—June 18th, Mont-Venoux Hill Climb; 19th, "Caravan" Avignon-Grenoble; 20th, arrival of the competitors at Aix; 21st, Battle of Flowers; 22nd, Automobile paper chase; 23rd, Road Race, Albertville-Montmelian; 24th, Dent du Chat Hill Climb; 25th, Speed Kilometre; 26th, an excursion; 27th, run from Aix to Grenoble; and 28th, Laffrey Hill Climb. As the dates clash somewhat with other fixtures it is possible there may be some further notification in regard to this meeting.

Official sanction by the Florida Automobile Association of the Automobile Races, which were organised in Florida, on the Daytona and Ormond Beach, was withdrawn at the last minute, owing to permission not having been obtained to hold them from the A.C. of America. The promoter, W. J. Morgan, however, carried them through as far as possible in spite of non-official recognition, and they took place on March 26th and 28th. Winton is reported to have covered the mile, at this meeting, in $52\frac{1}{5}$ secs., and 10 miles in 10 min. 26 secs, the latter beating the American record of 10 min. 50 secs. Hedstrom, on an Indian motor bicycle, was timed 1 min. $3\frac{1}{5}$ secs. for the mile, and E. R. Thomas, on an Oldsmobile car, was timed for 1 min. $6\frac{3}{5}$ secs.

Last week we announced that the Belgian Circuit des Ardennes would probably be advanced to June. It has now been definitely fixed for June 20th and 21st. On the first day a contest of the tourist cars, voiturettes, and motor bicycles will take place, the route of the circuit (147 kiloms.) being:—Arlon, Bastogne, Champlon, Saint-Hubert, Neufchateau, Habay, Arlon. This will be covered twice. On the second day the big cars will compete, starting from and returning to Bastogne, the distance for these being 512 kiloms. The Belgian National Circuit has been fixed for May 9th–14th, the route being from Brussels to Antwerp, Liège, Arlon, Namur, Charleroi, and back to Brussels. This circuit will be a modified reliability trial. A special "selling" class will be included, and the trial will also include hill-climbing trials, a kilometre speed course, &c.

VIBRATION PROBLEMS IN ENGINEERING SCIENCE.

By Professor W. E. Dalby, M.A., B.Sc., M. Inst. C.E.

The following lecture was read before the Automobile Club, on March 26th, by Professor Dalby, Dr. Boverton Redwood, D.S.C., F.R.S.E., in the chair.

The Chairman pointed out that Professor Dalby needed no introduction to them, it being well known that he had recently been making a research into the causes of vibration and a means for preventing vibration in engines, and that he was the author of a well-known text-book on that subject. He also pointed out the importance of this question to automobilists.

The lecture was as follows:—

Vibration problems in engineering science arise from the fact that the different parts forming engines and machinery are always changing their motion relatively to the frame, the change being in general continuous and periodic.

To change the motion of a body requires the action of a force, and it is the equal and opposite aspect of these accelerating forces which, acting on the engine frame, tends to set it and the foundations to which it is attached in vibratory motion.

Change of motion may take place in two typical ways:—

1. Change of speed in a straight line. This is the case with the reciprocating parts of an engine.
2. Change of direction, the speed remaining constant. This is sensibly the case with all the rotating parts of a steam engine.

Force must act in each of these cases. As usually understood, the word force does not convey the idea that a force acting one way must necessarily be accompanied by a force acting in the opposite way; yet such is the case. A push must always be accompanied by an equal and opposite push, a pull by an equal and opposite pull, a twist by an equal and opposite twist. A very cursory examination of any machine or engine will show that none of the parts are moving in the natural mode. No part passes over equal intervals of space in equal intervals of time in a straight line. Hence we may expect a very complex system of forces to act on the engine frames as a consequence of the complicated motion of the moving parts.

A few experiments were shown to illustrate the effect of compelling a weight to rotate in a circle, illustrating the point that motion in a circle is constrained by a force acting towards the centre, and that the equal and opposite of this force in a revolving system acts on the shaft, and through it to the frame, causing oscillation. The way of balancing first one weight and then four, so that there might be no oscillation of the frame, was then shown.

A model of a locomotive was then driven to show the effect of changing the speed in the line of stroke of the reciprocating parts. Revolving balance weights were added and their effect exhibited. This illustrated the general principle that reciprocating weights cannot be properly balanced by the addition of revolving weights.

In arranging any set of masses to mutually balance one another, two conditions must be separately satisfied:—

1. All the forces acting on the frame must form a system in equilibrium.
2. The moments of these forces about any point in the axis of rotation must form a system in equilibrium.

These conditions cannot be satisfied unless there are four cranks on engines of the usual type. If three cranks only are possible they must be placed mutually at 180 degrees. These rules are only approximately true, because of the effect of the connecting-rod in disturbing the reciprocating motion of the parts from the kind assumed in the usual calculation, namely, simple harmonic. Methods of including the effect of the connecting-rod have been worked out, but at least five cranks are required for this purpose in engines of the ordinary type. For with the many arrangements of cylinders and cranks used in motor car work no general rule can be given. Each case must be worked out specially to satisfy the two conditions stated above.

There are few people who have not had some experience of steamship vibration. An idea current not very many years ago was that the propeller was the main cause of the ship vibration. Mr. Yarrow disproved this notion by his classical experiments on a first-class torpedo boat. The propeller was removed, and the boat moored in still water, and the engines run light under different conditions of balancing. The consequent vibrations disclosed themselves by the ripples on the surface of the water proceeding from the vibrating hull. Unbalanced engines caused a set of ripples, which were smoothed out as soon as the engines were balanced. Marine engines are now built on the Yarrow-Scklick-Tweedy system, in order to eliminate as far as possible the vibration of the hull. Of course, the propeller must be balanced as well, otherwise it causes vibrations as well as the engines.

[Experiments were shown with four crank models of balance and unbalanced engines.]

There is another cause of vibration, apart from the balancing of the engines, which is of special interest to motor car builders. Whatever may be the instantaneous value of the turning effort exerted on the crank-shaft, an equal and opposite turning is exerted on the engine frame, and through it on to the frame. Hence the problem of making the turning effort as uniform as possible is a very important one, and I venture to think will receive more attention in the future motor car engines than it has done in the past.

[Slides were exhibited showing the turning effort exerted on the crank shafts of different types of steam engines, and were compared with the very irregular turning effort from a modern gas engine which has a similar turning effort curve to that of a petrol motor.]

The true solution of all these difficulties is to be found in the electric motor. All the moving parts of the motor can be easily and accurately balanced. And the turning effort of the worst kind of motor is more uniform than the turning effort of the best multi-cylinder modern steam engine.

The lecture was followed by an interesting discussion, which was opened by Mr. Wilson (of Messrs. Wilson and Pilcher), who is well known to have devoted a considerable amount of attention to the subject in question and to be the constructor of cars in which vibration is remarkably absent. Other speakers included Mr. T. Clarkson, Mr. O'Gorman, Col. Crompton, and Mr. Worby Beaumont.

The proceedings terminated with a most cordial vote of thanks to Professor Dalby for his very interesting lecture.

VERY bad weather was experienced last Saturday, on the occasion of the first run of the Manchester Automobile Club to Congleton and back, a distance of about 30 miles. Fifteen cars, in spite of the unpropitious state of the elements, persevered with the run, and were none the worse for the trip. Amongst those members and friends who were present were:—Mr. S. Brooks (12-h.p. Belsize); Mr. H. Bright, Mrs. Bright, Miss Vyvyan, and Mr. J. K. Lees (6-h.p. Daimler); Mr. W. H. Cameron, with Mr. Pattison (5½-h.p. Wolseley); Mr. G. P. Dawson, Misses Dawson, and Rev. W. H. Bonsey (8-h.p. Panhard); Mr. A. E. Jones, Mrs. Jones, Mr. and Mrs. J. Schofield (9½-h.p. Clément); Mr. A. Laidlaw (9-h.p. Daimler); Mr. T. Lloyd (6-h.p. Argyll); Mr. J. A. Morris (12-h.p. Belsize); Mr. F. Smith, two sons, and Mr. W. E. Rowcliffe (12-h.p. Daimler); Mr. H. W. Smith, Mr. Preston, Mr. McKenzie (9-h.p. James and Brown); Mr. J. Hoyle Smith and party (12-h.p. Belsize); Mr. G. Crossland Taylor and party (10-h.p. Wolseley); Mr. J. Whittaker, Mr. F. D. Emery, and Mr. T. R. Tetley (12-h.p. Daimler); Mr. A. W. Walton, Mr. and Mrs. Holmes (8-h.p. De Dion); Mr. F. Thompstone, Mr. and Mrs. W. Brown (8-h.p. Daimler).

THE weather everywhere throughout the country appears to have been equally bad, and the Western Section of the Scottish Automobile Club was not more fortunate in its first Club Run of the season last Saturday than other Clubs that had arranged thus early to commence their periodical outings. The run on Saturday last was to Ayr, heavy rain and excessively high winds being experienced during the early part of the day, a slight improvement taking place in the afternoon. A good number of cars started, but many were discouraged by the weather and did not complete the day's programme. Amongst those who went through with the run were:—Mr. J. W. W. Drysdale (8-h.p. Albion); Mr. John Trotter (Gladiator); Mr. L. C. Seligmann (7½-h.p. Wolseley); Mr. Wm. Beattie (16-h.p. Napier); Messrs. J. Hunter Steen and C. J. Campbell Steen (10-h.p. Wolseley); Mr. James Wilson (Elswick); Mr. F. J. Smith (20-h.p. Wolseley); Mr. W. H. Steen (9-h.p. Darracq); and Mr. Wm. Weir (10-h.p. Wolseley).

LORD BURTON has acquired one of the new type 14-h.p. Daimler carriages.

THE Norfolk Automobile and Launch Club have become affiliated to the A.C.G.B.I.

FOUR hundred and fifty wheels were, at the Agricultural Hall Motor Car Show which closed last Saturday, provided with Dunlop Motor Tyres.

THE Electromobile Company, Limited, have taken the livery stables known as East's, in Curzon Street, Piccadilly, which they will adapt for a garage and electromobile charging station.

THE *Motor Cycle* is a new paper issued last week by Messrs. Iliffe and Sons, Limited, for the purpose of dealing solely with the sport which is covered by its title. The price is 2d. weekly.

WE have seen Count Zborowski's name considerably distorted in type from time to time, but we think the efforts of the *Motor Age* in this direction deserve recognition. Their version of the name is Count "Tborrowiski."

MR. S. F. EDGE has been to the trouble of weighing up accurately, under the racing rules, the Gordon-Bennett Napier racer, which we illustrated in our special plate last week. The exact weight of these cars as they will compete in the race is found to be 19 cwt. 97 lbs.

MR. GEORGE G. HELMORE, Secretary of the Automobile Mutual Protection Association, tendered his resignation at the annual general meeting held last week. Mr. Helmore, whose resignation was accepted with regret, will remain in office pending the appointment of his successor.

A NEW depôt has been arranged for the better showing of the White steam cars, at 35-37, King Street, Regent Street. The new premises will be fully opened by May 1st, and in the meantime cars will be on view both at the present premises, 19, Prince's Street, Westminster, and at the new showrooms in King Street.

"BETTER roads" is now justly becoming a burning subject for consideration, and in several directions the subject is being taken up with commendable assiduity. Next Monday (April 6th) Mr. Robert J. Thomas, M.I.C.E., will make "Road Maintenance and Administration" the subject of a paper which he is reading before the Society of Engineers.

THE King and Queen, it is officially announced, will visit Ireland in July or August. We are afraid it is almost too much to hope for, that the date will be early enough for them to be present at the Gordon-Bennett Cup Race. If it could be arranged, however, it would be the finishing touch to the wonderful achievement of being able to hold the race in the British Isles at all.

MANY of the public, whether they be automobilists or not, who have heard the ear-piercing screeches of many of the country cart brakes, will learn with satisfaction that there is a remedy against those fiends who can allow such an annoyance to exist without the smallest attempt to remedy it. A delinquent in this respect last week was charged at Sheffield with the offence and fined 5*s*.

In regard to the paragraph last week in which it was stated that six petrol motors built by the Automobile Components, Limited, were at present being employed by the North-Eastern Railway Company on their Hartlepool line, the Automobile Components, Limited, now advise us that, although they have six on order, only one has so far been actually delivered to the railway company.

Upon the occasion of the first annual banquet of the Society of Motor Manufacturers and Traders, which was announced to take place last night (Friday), Sir John Thornycroft occupied the chair. The occasion was made the opportunity for the Chairman to present the Society's gold medal for the first time to Mr. S. F. Edge in recognition of his great services to British automobilism by winning the Gordon-Bennett Cup last year on an English-made car.

The Milnes-Daimler omnibus which was recently acquired by the Hastings and St. Leonards Omnibus Company, has been working with perfect regularity since its delivery. For the first twelve days, whilst under close observation by one of the Milnes-Daimler representatives, the omnibus covered an average of eighty miles per day, earning an average of £9 per day, equal to 27 pence per 'bus mile. The vehicle plies for hire along the front.

Messrs. Arthur and Stanley Spencer are completing a new airship, fitted with a 24-h.p. engine, with which they hope to make trips from the Crystal Palace to Epsom, Ranelagh Club Grounds, Richmond Park, and other points in the neighbourhood of London, and back. It is anticipated that a speed of 25 miles an hour will be attained, and the principle will be, as in their former airship, a screw, with a continuous pull of 250 lbs., working in front and acting as a tractor. Steering will be effected by means of a 15-foot rudder at the rear.

A sequel to the unsuccessful journeying of the "Passe Partout" was enacted at Marlborough Street Police Court last week when Dr. Lehwess was summoned for having on the occasion of the start from Hyde Park last year displayed an advertisement on the vehicle, it being contended by the police that the name on the car brought it within the Act. Mr. Denman, the magistrate, very sensibly took a different view, and, in dismissing the summons, said it was not like a big circus going through the Park to advertise a show, and that mere names could not be called advertisements.

Messrs. Carless, Capel, and Leonard's new petrol list is to hand, and since the last issue has shown considerable growth. There are over 120 additional names in the new edition, and the alphabetical arrangement under names of towns renders it extremely handy for reference. In addition, there are several matters of much interest to automobilists, including an explanation of what petrol is, the regulations governing the keeping and use of petroleum, and densimeter readings for petrol at various temperatures. Upon application to the firm at Hope Chemical Works, Hackney Wick, N.E., a copy of the little book will be sent free.

The Lincolnshire Automobile Club have views of their own, and they are not afraid of expressing or advocating them in the interests of automobilism generally. Only recently they took up a very strong position by passing a resolution to the effect that no member of the Club actually engaged in "the trade" should be eligible to serve on the Committee. They now announce that they have decided to entertain at luncheon all the road surveyors of Lincolnshire on April 16th, no doubt, with the object of giving their personal experience on the roads of the district. The Chair will be occupied by Mr. Garfit, M.P., and a suitable paper will subsequently be read by Mr. Rees Jeffreys.

At the second annual dinner, held last week at the Horseshoe Hotel, of the works employés of the Locomobile Company of Great Britain, about 80 guests sat down. Mr. G. J. Shave, the works manager, occupied the chair, and so pleasant an evening was spent that midnight arrived all too soon for those assembled. Mr. W. M. Letts, the managing director, in reply to the toast of the evening, gave some excellent commercial advice to his co-workers, founded upon the practical personal experience of which he has given in the past such an excellent account. Mr. Letts also outlined the future policy and prospects of the Company, which promised even to exceed considerably in prosperity anything that they had hitherto known.

To-day (Saturday) a motor cycling tournament is announced to take place at the Canning Town Memorial Grounds. The programme includes an open handicap, an exhibition spin by A. A. Chase, and a series of races between Fred Chase and Harry Martin. Five events will be contested, viz., one mile with flying and standing starts, and five miles with flying and standing starts, in all of which Chase will ride a 2¾-h.p. Bat, and Martin a 2¾-h.p. Excelsior. The fifth event will be one mile, Chase riding a 4½-h.p. Soncin, and Martin a 2¾-h.p. Excelsior, Martin receiving half a lap start. Evidently by this announcement the Messrs. Chase are none the worse for their mishap at Doncaster, last week, when they were overturned in their car.

A big demonstration of automobilists on their cars it is suggested should be held in Hyde Park with the object of protesting against the petty annoyances to which automobilists at present are subjected. Opinions differ considerably as to the wisdom of the step, as the feeling of irritation which such a proceeding sets up in anti-automobilists must not be lost sight of. In any case an organised meet cannot take place in the Park without authority being obtained, and as permission has previously been refused to the Automobile Club on occasions when the assembly was merely for the purpose of starting on a trial or tour, there is no reason to suppose that the Park Ranger is likely to have changed his views sufficiently to assist a meeting promoted with the object now put forward.

The prejudice that prevails against motor cars is often responsible for the infliction of severe injustice on individuals. In this respect we greatly regret to find that juries, in many instances, are little if any better than magistrates or divisional judges of the King's Bench. These remarks refer to a case which recently came before the assizes at Birmingham. About a year ago, Mr.

Valentine New had the misfortune to collide with an elderly deaf gentleman who stepped backwards from a tramcar and absolutely walked into the Daimler motor car that he was driving. It was asserted on oath by Mr. New himself, by Mr. Alderman Lowe, and his daughter, witnesses of unquestioned position and persons evidently accustomed to estimate the speed of vehicles, that Mr. New was not driving the car at more than about seven miles an hour, that he was blowing his horn loudly at the time, and that he was guilty of no contributory negligence whatsoever. In addition, an independent witness named Ward, who also saw the accident, swore that the plaintiff was standing with his back to the motor car and deliberately walked backwards into it. Notwithstanding these statements and the fact that the plaintiff apparently produced no confirmatory evidence of his own case, the jury found for the plaintiff damages to the extent of £200. We cannot help thinking that this apparently highly unjust decision was to some extent the result of Mr. Justice Wills' cross-examination of the defendant. "Why," he inquired, with apparent heat, "did you keep on blowing your horn when you were only going at seven miles an hour?" and he made it appear as if the extra caution exercised by the defendant in blowing his horn was proof positive that he was driving at a dangerous rate of speed. Unhappy motorists! If they do what the law enjoins upon them, and blow their horns whenever they think it necessary, it is tortured into evidence against them that they were going at undue pace. Mr. Justice Wills, it will be remembered, was one of the judges in the Divisional Court who, when an application for a *certiorari* against the Worthing magistrates came up before him on the ground of the admitted prejudice of the Chairman of that Bench, compared automobilists to poachers, and declared that the well-known prejudice of magistrates against poachers had never been a ground for a *certiorari*, and that, therefore, admitted prejudice against automobilists ought not to be allowed to be so either.

The German Automobile Club have concluded affiliation arrangements with the A.C.G.B.I.

Country headquarters at Elkwood Park, Long Branch, N.J., are being acquired in connection with the A.C. of America.

The Scoville Automobile Bill (U.S.A.), which has now passed the Senate, puts the rate of speed at 8 miles per hour for cities and 20 for the country.

In the programme of the Chicago Automobile Club is included a run, on June 25th, to the Mammoth Cave of Kentucky, a distance of about 1,500 miles, Chicago being reached again on July 7th.

Not long ago the Winton Motor Carriage Company opened up very considerable extensions in connection with their works. They have now determined to double their works capacity within the next few months.

Endeavours are being made by the Automobile Club of America to compel vehicles of all kinds to show a red light at the rear. We hope they will succeed. In time it will be a positive necessity that the same provision should be made in Great Britain.

Barney Oldfield, whose racing performances we have recorded from time to time, has been engaged by the Peerless Motor Car Company for racing purposes through the present year. In the event of L. P. Mooers being one of the selected drivers on behalf of America for the Gordon-Bennett Cup Race, Oldfield will probably accompany him to Ireland.

There is a prospect of the threatened widespread litigation over the Selden patent in America being stopped, as an automobile manufacturers' combination is in course of being arranged which will include all those makers likely to come within the scope of the claim of the Selden patent holders.

Considerable mystery has arisen in the United States in connection with the registration at Albany of a Mercedes Company, with a capital of 2,700,000 dollars. It is now stated that the concern is to acquire the American rights and interests of C. L. Charley, of Paris, Charley being appointed general manager on the French side, the Company *claiming* to have the exclusive right to establish Mercedes agencies in the United States.

The great private speedway which has for some time been credited as in course of construction under arrangements with Messrs. W. K. Vanderbilt, W. C. Whitney, and A. Belmont, is entering on a new stage, as it is stated that some 1,600 acres of land have been acquired in Queen's and Nassau counties by them for the purpose of carrying out this scheme. Engineers are reported to be at work on the property, and the race tracks and the speedway—which will have a length of about three miles—are to be commenced forthwith.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Automobile Internationale (Limited).—Capital, £50,000 in £1 shares. Object, to acquire the business of La Société Anonyme Déchamps, Bruxelles, and to adopt an agreement with L. Swan. The first directors are M. Hill, C. J. Whittaker, L. Swan, and C. Bostyn.

A. Darracq and Co. (Limited).—Capital, £375,000 in £1 shares (100,000 six per cent. cumulative preference). Object, to acquire the business of A Darracq et Cie., carrying on business at Suresnes, France, and elsewhere; to enter into a deed of contribution between A. Darracq et Cie. and this Company, for the transfer to this Company of the said business in consideration of an allotment of 100,000 preference and 217,274 fully-paid ordinary shares, whereof the Anglo-French Motor Syndicate (Limited) is to receive 57,109 shares in respect of services rendered and expenses incurred by it in the formation of this Company.

"Huile Vitesse" Company (Limited), 66, Great Russell Street, W.C.—Capital, £32,000 in £20 shares. Object, to acquire the business carried on in and near Paris by P. Tachard, J. Tachard, and J. Rimbaud, under the trade marks "Huile Vitesse" and "Graisse Vitesse." The first directors are P. Tachard, J. Tachard, and J. Rimbaud.

Lancashire Wagon Company (Limited), 22, Broad Street, Bury.—Capital, £250,000 in £10 shares. Object, to adopt an agreement for the acquisition of the business of a company of the same name (incorporated in 1857). The first directors are A. Smethurst, H. Brown, J. H. Peacock, J. Battersby, and E. Burgoyne.

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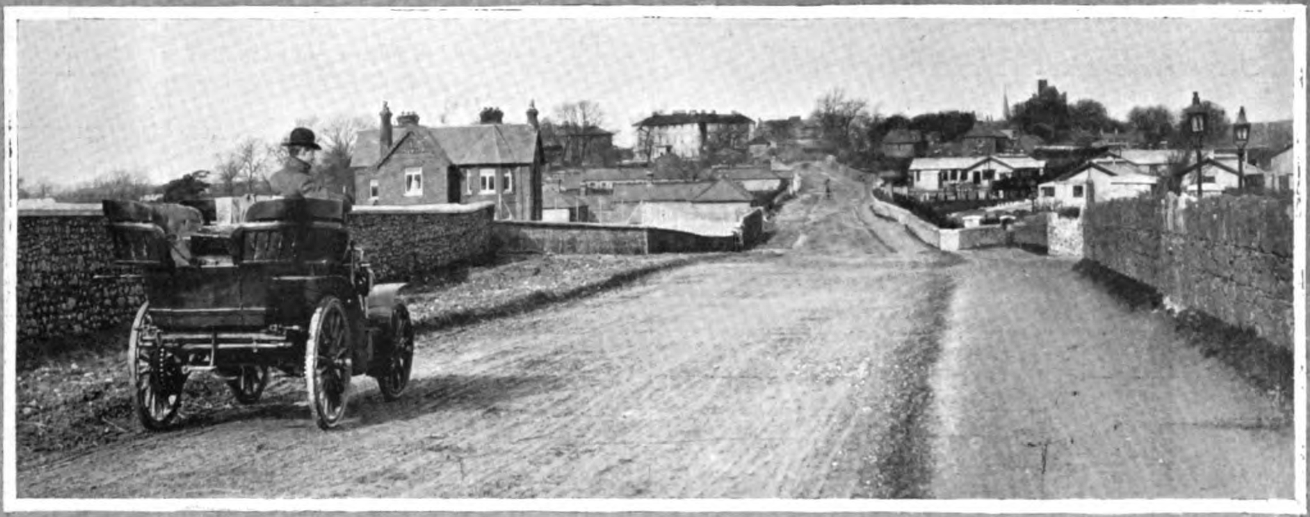

(Photo by W. Lawrence, Dublin.)

THE GORDON-BENNETT CUP RACE IN IRELAND.—ENTRANCE TO KILDARE FROM THE CURRAGH ROAD.

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
April 16...		Lincolnshire Auto Club Road Surveyors' Luncheon.
*April 24...		Quarterly 100 Miles Trial.
April 25...		Eliminating Trial Gordon-Bennett Race.
April 27, May 4, 11, 18		"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14		Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
May 23 ...		Scottish Auto Club Hill Climb.
*June 13 ...		Gymkhana at Ranelagh.
June 20 ...		Manchester Auto Club Hill Climb.
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park.
July 6 ..		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy.
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork.
		Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
July 24-25		Southport Speed Trials.
*August ...		Tourist Motor Bicycle Reliability Trial.
*September		The 1,000 Miles Trial.
1904.		
...		*Light Van Trials.
*Feb. 12-24		Crystal Palace Exhibition.

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
April 16-20 ...	A. C. de Touraine Tourist and other Trials.
May 9-14 ...	Belgian National "Circuit."
May 14	Paris-Madrid. Start of Tourist Section.
May 16-24 ...	Stockholm Exhibition.
May 18	Speed kilom.—Geneva (Swiss A. C.).
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May or June ...	Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-23 ...	Hanover Alcohol Van Trials (German Agricultural Society). Entries close Feb. 28.
June 18-July 28 ...	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21 ...	Circuit des Ardennes.
June 28	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16 ...	Race Trelex-Saint-Cergves (Swiss A. C.).
September ...	Udine Exhibition (Italy).
Oct. 15-21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

THE AUTOMOBILE CLUB AND ITS POLICY.

WE are pleased to be able to say that the Executive Committee of the Automobile Club have decided, in consequence of the strong protest raised by us in our issue of the 28th March, that the policy to which we took exception will be discontinued in future. We are very glad that the Club Committee have seen fit to adopt this line. We felt sure that once the Committee realised the serious situation they were drifting into there was no doubt about the course they would take. They have always displayed a spirit of fairness and impartiality since the foundation of the Club, and the support that that body has received and the powerful influence it has gained have been largely due to this fact. It is this support and this influence which has enabled it to direct and benefit the industry. It is obvious that the maintenance of the same attitude in future is as essential to the Club's mission as it has been in the past, and it is therefore satisfactory to learn that their original policy is now to be resumed. In future the *Journal* will be under the control of a committee consisting of the three new Club secretaries, and this control no doubt will be more efficient than that which has been exercised recently. The Club Journal has been the first venture the Automobile Club has made as a trading concern. We sincerely trust it will be the last, and that in accordance with the recommendations of the Committee, the trade character of the *Journal* will now finally disappear. It is, in our opinion, prejudicial to the position, the dignity, and the influence of the Club that it should be in any way a trading corporation. We should have expressed our opinion on this subject before now, both in the interests of the Automobile Club itself and of the automobile industry, but for the circumstance that the particular line in which the Club elected to engage in trade was of a similar nature to our own. Owing to the general policy which it has pursued from its start the Club has gained a degree of influence which has enabled it to act as an unprejudiced intermediary, both between the automobile public and the trade, and between both of these and the Government and Government officials. An institution which possesses such all-round confidence as to be able to act in this capacity may be in the future, as it has been in the past, of the greatest possible benefit to the automobile movement. But to maintain that position it must have no corporate trading interests of its own. It must be not only *sans peur* but *sans reproche*.

A SONG OF SPEED.

The *World's Work*, a good deal of the space of which is, as our readers are aware, devoted to motoring, this month contains a poem on the subject from the pen of Mr. W. E. Henley, with a "puff preliminary" by Mr. William Archer. The motor car has become a powerful factor in our life. As we have previously pointed out, it is effecting a revolution in society generally; it has figured in the Divorce Court in a prominent capacity, and it now, as we have shown elsewhere, promises largely to control our Parliamentary elections. It has, of course, appeared in fiction again and again, but we do not know a previous instance of a poem from a writer of high reputation being dedicated to it. In spite of the "puff preliminary," however, Mr. Henley's poem remains rather a weird production. In the case of a poem, the imagery of which is wanting in distinctness, a laudatory introduction is often of use. It acts on the reader very much like the descriptive programmes at our popular concerts, and Mr. Archer's eloquent preface to the poem may make it effective in quarters where it otherwise would not be. But, frankly, we are disappointed with it. It is not worthy of Mr. Henley's great reputation, and it is not worthy of the new locomotion. We quote the following :—

This marvellous Mercédes,
This triumphing contrivance,
Comes to make other
Man's life than she found it;
The Earth for her tyres
As the Sea for his keels;
Alike in the old lands,
Enseamed with the wheel-ways
Of thousands of dusty
And dim generations,
And in the new countries,
Whose Winds blow unbreathed,
And their Lights are first-hand
From our Father, the sun.
Thus the Mercédes
Comes, lo, she comes,
This astonishing device,
This amazing Mercédes,
With Speed—
Speed in the Fear of the Lord.

This does not to us convey an impression of speed. It is more suggestive of a bad knock in the connecting rods. The subject is one that perhaps might have been handled adequately by Shelley (hardly, perhaps, by anyone else).

" My coursers are fed with the lightning,
They drink of the whirlwind's stream,
And when the red morning is bright'ning,
They bathe in the fresh sunbeam."
—" *Prometheus Unbound.*"

TO DEVELOP IRELAND BY MOTOR.

Innumerable have been the causes assigned by politicians and others for the absence of prosperity which for upwards of a century has been the permanent condition of Ireland. The natural fertility of the country is so great that it ought, under favourable conditions, to be one of the most prosperous agricultural communities of Northern Europe. But all parties and shades of opinion agree that inadequate means of communication are largely, perhaps mainly, to blame. However Irishmen may differ politically and otherwise, there is one subject on which they are all ready to shake hands—the wretched nature of the existing "facilities" provided by the Irish railways. They make it hard enough even for travellers to get from place to place, but they are quite triumphant in rendering the carriage of produce practically impossible by the prohibitive rates which they impose. The Board of Trade has never dealt with them properly. And though Irishmen of talent and ability, like the late Sir Thomas Brady, have spent their lives in the endeavour to secure reform of the railway administration, things remain to all intents and purposes exactly what they always have been. The "light railways," too, have done little good, probably because they have been paralysed by the main lines, on which they depend. We have referred to the subject from time to time in the pages of this Journal. We are glad to be able now to announce that a day of reckoning for the Irish railways appears to be at hand.

The automobile promises to be, if not the salvation of Ireland, at any rate a very powerful benefactor of the country. We think the Irish people deserve that it should be. They have been so sympathetic and so unanimously enthusiastic in favour of the Gordon-Bennett Race, the possibility of holding which in the British Islands is, as all are agreed, of such high importance for the progress of the British industry, that it is particularly appropriate that the year in which that race will be run in Ireland, should see not only the introduction of a great and liberal measure of land reform in the island, but also the inauguration of a scheme of automobile transport which promises to be the biggest thing of the kind that has as yet been attempted. The automobile will take up and discharge those duties to the community which have been so scandalously neglected by the Irish railways. We refer, of course, to the scheme which has been put forward by Lord Iveagh and Mr. Pirrie, mentioned cursorily by us last week. These gentlemen are preparing to capitalise and push an extensive system of automobile transport for the express purpose of developing the economic, that is to say the agricultural resources of the country. Lord Iveagh is the head of the great Guinness firm, Mr. Pirrie the leading spirit of the firm of Harland and Wolff, of Belfast. There are no two men in Ireland better fitted, either by their intimate knowledge of the country or experience of industrial management, to successfully undertake a scheme of the kind. And it is a very significant circumstance that they are arranging to put up the money required themselves without making any appeal to the public.

The financial resources these gentlemen can command are, of course, enormous, but we are glad to know that their project is to receive not only Government encouragement but Government pecuniary support, if needed, as well. Part of the sum which is to be placed at the service of the Irish Administration by the new Land Purchase Act is to be devoted to the economic development of the country and the improvement of transit, and we understand that this means collaboration with Lord Iveagh's and Mr. Pirrie's scheme.

Details of that scheme are not as yet to hand, but it is safe to assume that it will be mainly directed to the development of automobile transport for agricultural produce, on somewhat similar lines to those which have been tried with success in Kent and elsewhere. Certain districts are to be experimentally tapped at first, and the experience and information obtained utilized for further development. At first it will scarcely be practicable to arrange to any extent to feed the existing railway systems in the manner advocated by Mr. Scott Montagu for Great Britain. The railway rates, as already pointed out, are generally too prohibitive to allow of that. At the commencement the undertaking will necessarily compete with the railways, and will probably be first advantageously developed by taking some of the many seaport towns as centres. When, however, the Irish railways recognise the power of their new antagonist, even they will probably reform and reduce their tariffs, and friendly co-operation will then become a possibility. The present Government has shown itself so appreciative of the economic needs of Ireland that we really think they might give the railways, by compulsory legislation or otherwise, a little assistance along the straight and narrow path they will ultimately be compelled to tread. It would be one of the most effective methods of benefiting the country. But however adequately reformed, railways will never be able to do all that a country like Ireland needs. It is so essentially a country of small holdings, often most remotely placed. Let the automobile once open to the small holder the markets of the world, or even the markets of the larger towns, and with the now existing fixity of tenure an era of prosperity for him will commence. It is a great and worthy experiment—we wish it all possible success. May it show us what the automobile can do for the regeneration of a country!

ANOTHER TRANSPORT SCHEME.

THE scheme for regenerating Ireland by motor car now being put forward by Lord Iveagh and Mr. Pirrie, to which we have alluded above, is not the only project which shows that the automobile is destined to revolutionise our means of communication on a commercial scale. An important undertaking of the kind is being inaugurated by Messrs. Furness, Withy and Co., with special reference to ports in the north of England. This firm is arranging an extended service of motor wagons to run in conjunction with merchant vessels trading to ports such as Newcastle-on-Tyne and those in Lancashire, of which, of course, Liverpool and Bolton will be the principal. The goods will be unloaded direct from the vessels into the motor wagons and delivered at a high rate of speed, and without the delay incidental to re-transference to railway wagons, to the surrounding district. This ought to save considerable expense, and effect a still greater economy in the matter of time. We await with interest the inauguration of the scheme, as it is, we believe, the largest undertaking of the kind which is likely to be started in Great Britain in the near future, and it will in all probability have the result of satisfactorily demonstrating what automobile transport, when adequately organised and capitalised, can effect.

"THE MOTOR."

THE verses which Miss Eva Anstruther has contributed to the *Westminster Gazette* on the motor, "To-day" and "To-morrow," have been widely quoted and much admired, and certainly the picture of the motor's future, and the revolution in the life of the working classes it will effect, is an attractive and, we do not doubt, a correct anticipation of what will soon come to pass. But we do not see that it is at all necessary to assume that because the motor becomes useful it will be "flaunted by Fashion." Fashionable people still ride bicycles though they do not parade the Park on them, and good carriage horses still have their votaries even in the very "smartest set." On behalf of automobilists, also, we should like to enter a mild protest against the comparison of the present day motorist with "the highwaymen of old,' though, doubtless, that line will appear to some of our magistrates, County Councillors, and police as the most meritorious in the poem. At any rate, it is a point of view which some of these potentates share. How can it be "useless to mankind," too, when it contributed £500 in fines to reduce the rates of the County of Surrey alone last year? We append the poem herewith :—

THE MOTOR.

TO-DAY.

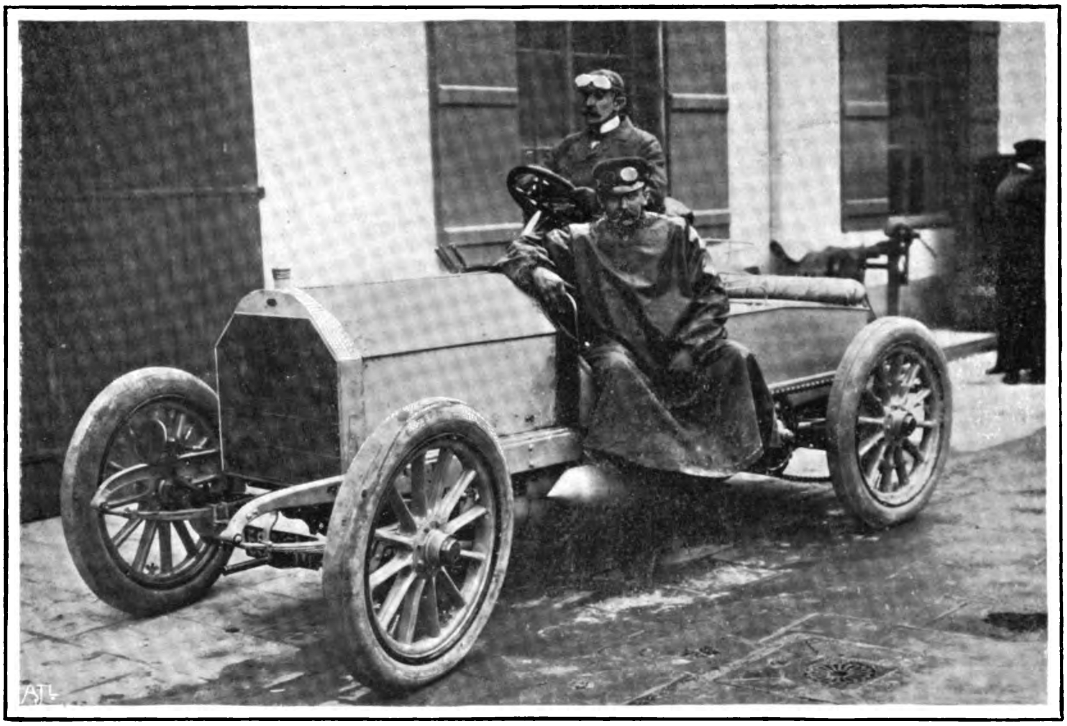
The rich man's fancy, Fashion's latest craze,
A costly toy for ever out of gear,
Topic on which men endlessly dilate,
Lawless the motor dashes through the land,
Scattering confusion, raising clouds of dust,
Annihilating distance, killing time.
Its riders, like the highwaymen of old,
All masked and hooded, fearfully disguised,
To humble wayfarers a source of dread:
A gaudy plaything, painted and veneered,
Pastime to some, but useless to mankind.

TO-MORROW.

Flaunted by Fashion, carelessly cast out
To join the rusty forms of once-loved bikes,
Plaything no more, its day of work has come.
Swiftly this erstwhile toy of idle men,
At ordered hours along an ordered road
Bears city toilers to and from their work;
Out from the airless streets, the dirt, the noise,
Into the sunlight of their own green land.
Solving the problem of the crowded town,
Giving to England's country back her sons,
Useful to all, a blessing to mankind.

COUNT ZBOROWSKI AND THE NICE WEEK.

The fatal accident to Count Zborowski, which we recorded last week, has naturally caused widespread sorrow throughout the world of sport, where the Count was so well known, and his sterling, sportsmanlike qualities so universally appreciated. The real cause of the accident will probably never be known. The Count, although a bold driver, was not reckless, and he has shown such perfect nerve and courage in all other races in which he has competed. It is stated that he was inclined to nervousness, in consequence of some fortune-teller having predicted his death in the race. We can hardly believe it of a man of the calibre of the Count, but it is possible he did not fully realise the terrific power of the Mercedes car which he was driving, and took chances of getting round the fearful corner which was hardly justified under the circumstances. The Count's remains have now been conveyed to England for interment at Barton Lazars, about two miles from Melton Mowbray.

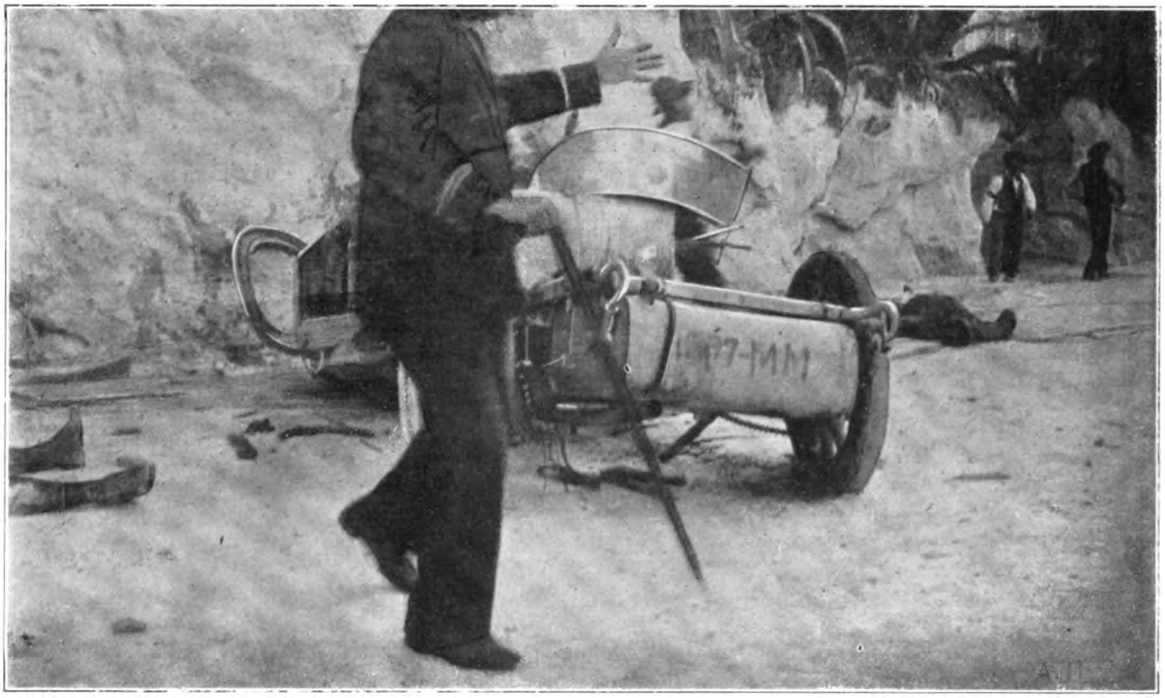


Count Zborowski and M. de Palange on the 60-h.p. Mercedes previous to the disaster.

His chauffeur companion, M. de Palange, who at first was announced and thought to be dead, fortunately has since sufficiently recovered to be pronounced practically out of danger. He is stated to be a Baron and to come from an old noble family. By stress of bad luck and heavy losses through his lawyers he was compelled to earn his livelihood, and selected the *rôle* of chauffeur as a profession. Baron H. de Palange-Ales, of Chateau de Trigonant, however, claims that *he* is the only person of that name entitled to use the prefix. In an interview with a correspondent M. Palange has given his views of the accident:—

"Count Zborowski," he said, "manifested nervousness and impatience, and he was determined at all hazards to win the contest. When the signal was given the automobile started like a rocket, and it seemed as if we were flying. We followed the middle of the road, and in a few moments arrived at the turn, where we veered to the left. We thought that once having passed the angle it would be easy for us to make a quick turn and continue without hindrance, but the speed was too great. Count Zborowski, realising the danger, tried to block the wheels, but he was unable to do so, and in a flash we were in front of the rocks. At this moment we were going at about fifty-six miles an hour. We did not have time to make a movement or to utter a cry. The automobile struck the rocks with a frightful crash. Whether the Count fell, or remained on the automobile at this moment, I cannot say. As for myself, I was flung out upon the road, and there rendered unconscious."

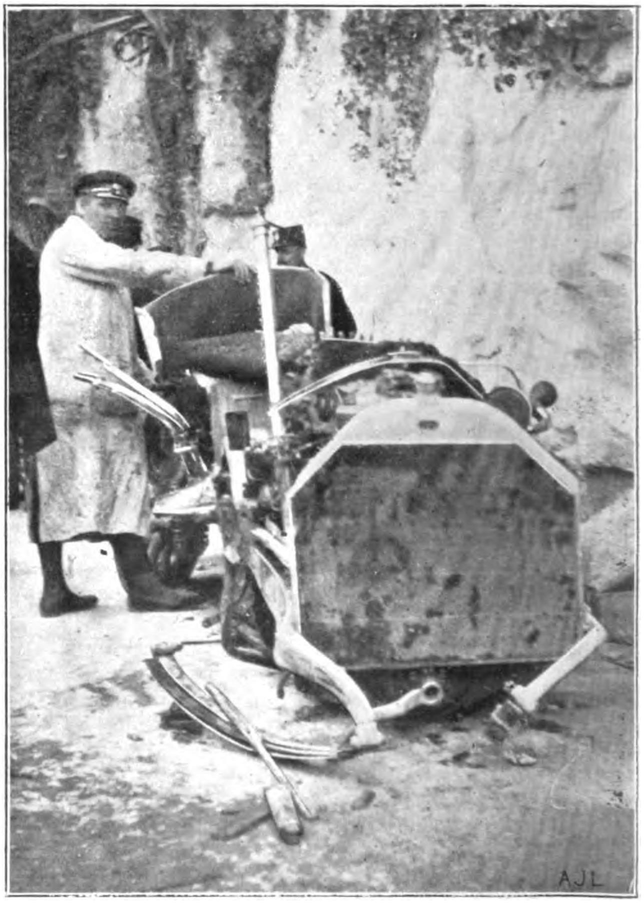
The photographs which we reproduce of the scene immediately after the accident need no words of description. The terrible catastrophe is only too plainly visible in each of them. As already stated, the authorities abandoned the rest of the Turbie Hill Climb for the day, proposing to complete this event next day and go through the rest of the week's programme; but the Government stepped in and forbade further speed trials on the Turbie Hill, and also refused permission for the de Caters Cup and other racing events of the Nice week, so that the rest of the programme



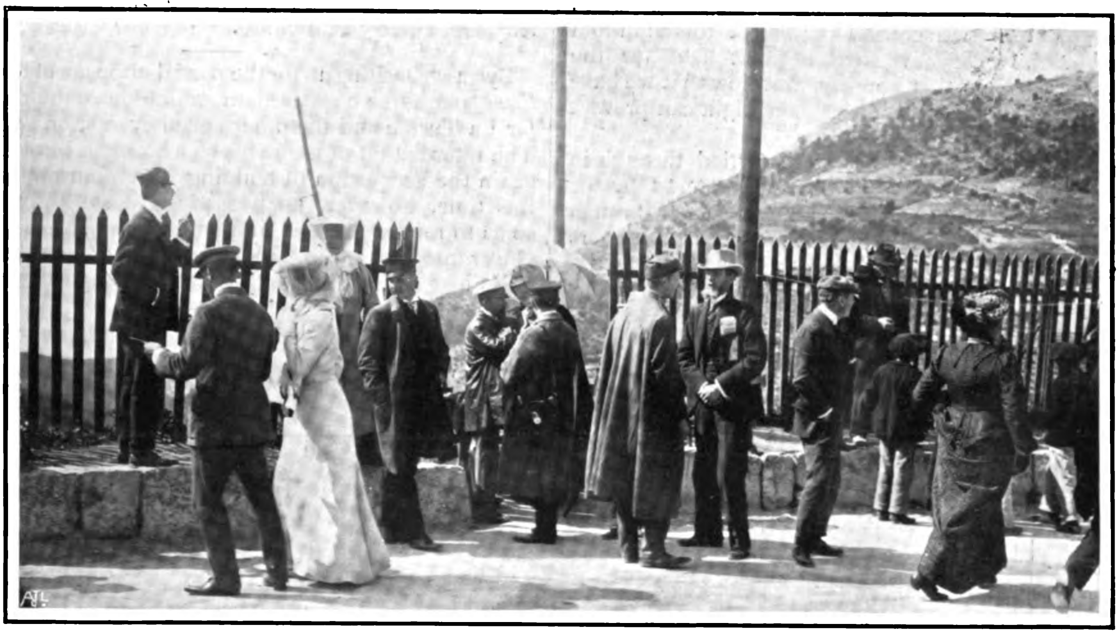
Immediately after the crash.—The Count's body is seen to the right, and the position of M. Palange's body is seen to the left.

was practically reduced to the Brake Tests, the Concours d'Elégance, and the Fuel Consumption Tests.

The accident will no doubt lead to the entire suppression of the Turbie Hill events in the future, and possibly be the cause of placing further restrictions on road-racing generally throughout France. For the moment the method of dealing with the immediate fixtures by the French Government is somewhat hysterical, as the circumstances of the accident warrant the suggestion that with ordinary caution such a thing would not have occurred. That La Turbie Hill is a dangerous course there is no question, but it does not follow that racing on suitable roads should be altogether prohibited on that account. There have been people killed in horse racing and hunting but too often, but no one ever

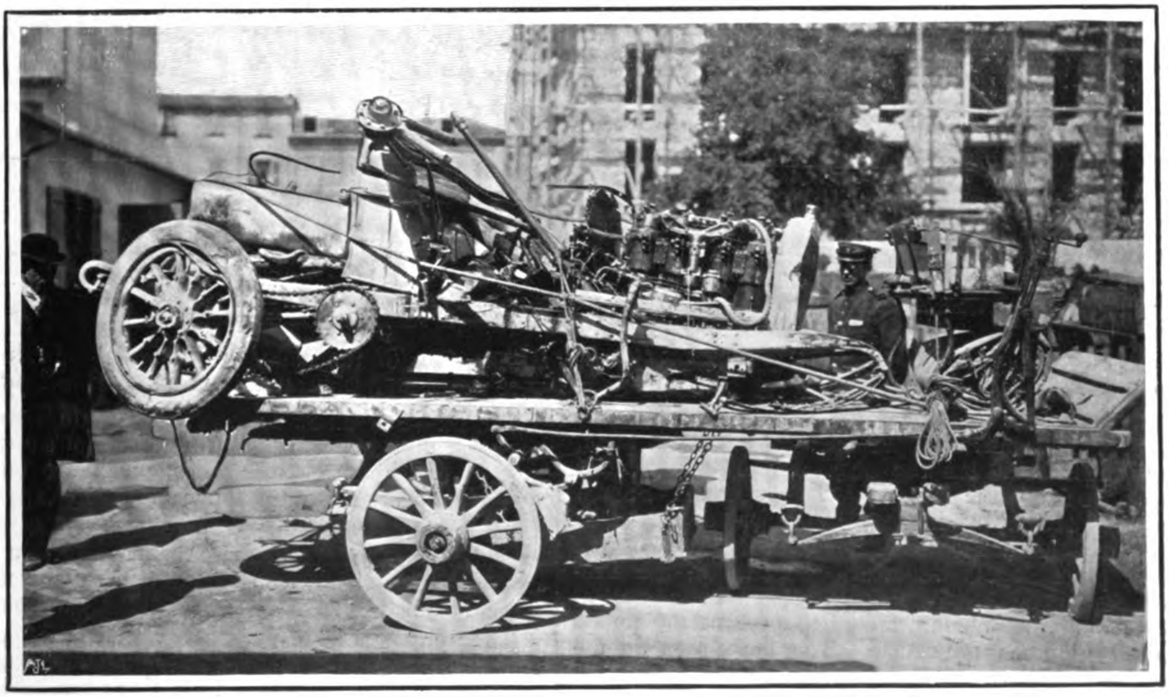


Count Zborowski's death.—The scene of the accident, showing the fearful nature of the smash.



1—Grossherzog von Mecklenburg-Schwerin.
2—Prince Lubecki.
3—Grossherzogin Anestoria von Mecklenburg-Schwerin.
4—Hieronimus, who holds the record of 14 mins. 26⅘ secs.
5—Mr. Gray Dinsmore.

At the summit of La Turbie.—The road Marshals, Hieronimus, whose time of 14 mins. 26⅘ secs. is the record for this hill, and others awaiting the arrival of Count Zborowski's overdue car.



The remains of the 60-h.p. Mercedes being conveyed to the railway, *en route* for Cannstatt.

thought of prohibiting these national sports on that account. It is not a good thing to entrust powers of this kind to a single individual. We have had a great fight for the Gordon-Bennett Bill in this country, but now that we have got it, no ukase of a single Minister in a fright can prevent it from being held.

The rest of the Nice festivities were carried through in a very half-hearted manner, the gloom engendered by the fatal accident to Count Zborowski making itself felt through every section of the pleasure seekers. The "Concours d'Elégance" on Thursday, nevertheless, brought forward a splendid gathering of cars, with the result that the first four awards were made to No. 14, Baroness Zuylen (Spider Mercedes); No. 53, Prince J. de Bourbon (Panhard); No. 57, Mme. Camille Blanc (Gobron-Brillié); and No. 58, Dr. Ladmiral (Delahaye).

Mr. Warden's decorated Panhard car, which secured the First Prize in the Floral Parade at Nice. The vehicle was a perfect bower of White Lilac, Snowdrops, Anemones, and Carnations.

Had the prohibition of the mile and kilometre trials on the Promenade des Anglais held good it would have been a serious blow to the leading makers who had prepared specially constructed vehicles to represent them, amongst these being the two new 110-h.p. Gobron-Brillié which arrived on the Friday. The supreme French authorities, however, by dint of argument and persuasion were induced ultimately to revise their decision to the extent of permitting One-mile Speed Trials on the Promenade des Anglais on Tuesday morning last, starting at about 5 a.m., barriers being erected to prevent the public from getting too near the course. The brake-tests on the Braus Hill took place on the previous Saturday, and the fuel consumption test on Sunday. M. Serpollet, since the prohibition, ran the gauntlet of the police, and claims to have covered the Turbie course in 13 minutes. The running for the Caters Cup—over a standing kilom.—will probably be transferred to *L'Auto's* next Gaillon Chateau Thierry Hill climb.

By way of making up for the partial stoppage of the races, the fêtes committee organised an exhibition of the cars, entered for La Turbie and the other speed events, on Monday last. The interdiction of the races has brought into prominence again the suggestion of building a motodrome near Nice, this time, however, upon a much more ambitious scale, so as to render the Nice automobile week independent of Government control. A scheme for a circular course of 50 miles in a secluded locality is also being put forward.

The brake trial rules divided the brakes into two categories, viz.:—

Cat. I.—For brakes acting direct on the back wheels independent of the motor or differential. In this the cars were tested both whilst running backwards and forwards.

Cat. II.—For a new form of brake "de secours" or emergency brake which shall be capable of stopping a car quickly under any circumstances, preference being given by the judges to apparatus applicable to any car.

All brakes acting direct on to the rubber tyres were excluded, as also differential-gear brakes. Cars in which the wheels are normally coupled direct to the motor for these trials had to have these parts entirely disconnected.

The "endurance" test was only open to cars in Category I. This consisted in the cars running down a hill in a minimum and a maximum time, four stoppages by signal being enforced during the descent.

A maximum distance of 20 metres (65 618 feet) was allowed for bringing each car to rest. The following were the distances in which the vehicles were actually stopped and the times in which the full distance was covered :—

	Distance in feet.	Time in minutes.
Garin (Rochet-Schneider)... ...	19·685 ...	19
„ „ „	39·371 ...	20
Gallice „ „	55·775 ...	20

The cars were then, with free engine, started running backwards for a distance of 33 feet down the hill, the distances stopped in, at a given signal, being :—Rassinier, 1·85 metres; Gallice, 2·60 metres; Garin I, 3·20 metres; Garin II, 3·20 metres.

In the fuel consumption trial each competitor received 100 grammes of petrol per 50 kilogs. of gross weight of car completely equipped. Each vehicle had then to cover the longest distance possible over a prescribed course on the Place d'Armes, the winner being determined by the distance run. For this event twenty-five entries were received. The results are given in the annexed table :—

	Driver.	Make and horse-power.	Petrol in kilogs.	Distance covered in kiloms.	Gross weight in kilogs.	Running time. h. m. s.
1	De Millo	6-h.p. Renault Voiturette	1·890	33·702	945	1 27 24
2	Blanc ...	6-h.p. "Populaire" de Dion-Bouton	1·080	31·483	541	1 33 39
3	Portal ...	6-h.p. "Populaire" de Dion-Bouton	1·066	31·050	533	1 33 30
4	Canet ...	6-h.p. Panhard-Levassor	2·505	29·270	1,275	1 11 5
5	Ballot ...	12-h.p. Richard-Brazier	2·065	26·030	1,082	58 34
6	Dumas ...	8-h.p. Rochet-Schneider	2·255	24·470	1,128	58 42
7	De Lafreté	6-h.p. "Populaire" de Dion-Bouton	1·300	24·280	681	1 12 25
8	Marshal ...	12-h.p. Rochet-Schneider	2·240	19·603	1,121	48 59
9	Jolliet ...	16-h.p. Rochet-Schneider	2·815	19·080	1,408	38 56
10	Dupré ...	6-h.p. Panhard-Levassor	1·865	18·653	940	49 24
11	De Barry	15-h.p. Mors	2·495	14·230	1,250	31 15
12	Tiranty ...	4-h.p. Renault... ...	1·145	13·230	573	34 31

The mile and kilometre speed trials took place in glorious weather, on the Promenade des Anglais, on Tuesday morning, from 5 to 7.30 a.m., the only hours which the Government would allocate to them. The following are the chief results, the mile winner being driven by Braun :—

STANDING MILE.

		min.	secs.
1.	A. Harmsworth (60-h.p. Mercedes	1	3·72*
2.	Werner (60-h.p. Mercedes)	1	4·03*
3.	Rigal (60-h.p. Mors) ..	1	5·32*
4.	Le Blon (20-h.p. Serpollet)	1	6·26*
5.	Degrais (60-h.p. Mercedes)	1	7·26*
6.	Augières (60-h.p. Mors) ..	1	7·95*
7.	Baras (45-h.p. Darracq) ..	1	8·02*
8.	Gabriel (60-h.p. Mors) ..	1	8·56*
9.	Hieronimus (60-h.p. Mors)	1	9·62
10.	Marq. Ferté-Meun (40-h.p. Mors)	1	9·79
11.	Gentil (4-h.p. Griffon motor cycle)	1	16·95
12.	Demester (ditto ditto) ...	1	36·41

THE ROTHSCHILD CUP (FLYING KILOMETRE).

		secs.
1.	Leon Serpollet (20-h.p. Serpollet)	29·19*
2.	Le Blon (20-h.p. Serpollet) ..	30·55
3.	Werner (60-h.p. Mercedes)	32·30
4.	Augières (60-h.p. Mors) ..	32·66
5.	Hieronymus (60-h.p. Mercedes)	33·63
6.	Rigal (60-h.p. Mors) ..	33·64
7.	Baron de Caters (60-h.p. Mercedes)	33·85
8.	Degrais (60-h.p. Mercedes)	33·96
9.	Marq Ferte-Meun (40-h.p. Mors)	34·66
10.	A. Harmsworth (60-h.p. Mercedes)	34·96
11.	Gabriel (60-h.p. Mors) ..	35·50

* Broke record.

All racing was stopped punctually at 7.30 and the course patrolled by the military. Unfortunately, thinking all chance had gone of holding these trials, several of the leading cars had departed. There was, however, still a fine array of entries and much enthusiasm prevailed amongst those present, evening dress being conspicuous in several directions. Records tumbled down like ninepins—no less than eight beating Augières' standing mile record of 1 min. 9 secs. M. Serpollet winning the Rothschild Cup for the third time secures it *in perpetuum*. Times were recorded, by means of the Mors electrical apparatus, to the 100th part of a second.

Re HANDICAPPING AND CLASSIFICATION FOR MOTOR BICYCLES.

MR. ERNEST ARNOTT sends us the following copy of a letter which he has addressed to Mr. Straight, Secretary of the Motor Cycling section of the Automobile Club, upon the above subject :—

"At present the tendency seems to be, as in the case of the reliability trials, to classify by cylinder capacity. I think that if this standard is adopted for *races* a great mistake will be made, and that the standard be fixed by weight, and this for many reasons.

"I believe that the objects of the racing rules will not be only ease of handicapping, but also the improvements of motor cycles in general by competition, and the abolition as far as possible of freaks, and the use of commercial engines—and the question is, how is this to be done? To my mind, the cylinder capacity standard absolutely fails in this, and is most unreliable as a means of handicapping, and the following points have in addition in each case to be taken into consideration, when determining the horse power; number of revolutions per minute, compression, size and weight of flywheels, size of valves, etc.

"The tendency of the cylinder capacity standard would thus be to encourage very high compression, and freakishly large and heavy flywheels, as these points would not be penalised in any way. As far as the handicapper is concerned his lot would not be at all happy. In the case of two machines, apparently identically the same, being entered for a race (say 2¾-h.p., with bore and stroke 76 × 76), it would not be possible for the handicapper to know that one of the engines had had a little turned off the top of the cylinder, and the compression increased—thus altering its power for better or for worse, as the case might be—and it would be nearly impossible to check this. Handicapping, in the strict sense, must for motors, I think, be very much of a lottery, and I believe the simplest and best way to arrange these matters would be to work on the Continental lines, namely, *classes* confined to certain *weights*, no handicaps at all in the strict sense. The advantages of the weight system include ease of checking, only a weighing machine being required; the encouragement to manufacturers to reduce weight, this being as equally important as securing the greatest amount of power from a given cylinder capacity. The beneficial results from this system are very fully demonstrated by the enormous reduction in the weights of cars during the last two or three years—the strength apparently being in no way sacrificed. The same remarks apply to Continental motor bicycles, and an example can be found in the Werner 2¾-h.p. motor bicycle, which is some 30 lbs. lighter, I believe, than any other motor bicycle of the same power.

"One other feature, from a sporting point of view, is that owners of English motor bicycles would be able to compete in Continental races if the weight limits were fixed at the same standards. At the present time there is, I believe, not a single English motor bicycle entered for the Paris-Madrid race, the reason for this being purely a question of weight, as there is not an English motor bicycle of, say, 2¾-h.p. which weighs less than 50 kilogs. (110 lbs. without accumulators) specified by the French authorities.

"There is the possibility that before many years are gone England may wish to push the sale of motor bicycles on the Continent as she has done with ordinary cycles, but I am quite sure that unless the English motor bicyles are run in the Continental races, and run successfully, England's chance of a market will be hopeless, as the value of long-distance racing tests are very fully recognised over there. The classes on the Continent are :—

30 kilogs. (66 lbs.) and under,
50 kilogs. (110 lbs.) and under,
250 kilogs. (550 lbs.) and under,

in all cases without accumulators.

"I would suggest a further class of 70 kilogs. (154 lbs. and under). This would include :—Bat, Excelsior, Riley, and other makes using M.M.C. engines, and also Humbers and others.

"I sincerely hope that the Automobile Club will accept the Continental ruling, which has proved so satisfactory both from the point of view of sport and mechanical improvement, and will not inaugurate a new classification at variance with that of any other country."

THE CHENARD AND WALCKER 14-H.P. PETROL CAR.

We have already dealt very fully with the chief characteristics of the Chenard and Walcker petrol cars, and we gave a full description of the 10-h.p. type in our issues of January 31st and February 7th, following this up more recently, as regards the ignition system, in an article on the subject of synchronising multi-cylinder motors, which appeared on March 7th. As we have pointed out previously, the 14-h.p. car is fitted with an entirely different transmission mechanism to the smaller type, and although it has not a live rear axle, yet the power is transmitted from the gear-box to the rear wheels by means of a universally-jointed propeller-shaft and bevel gearing. In this model the engine, the main clutch, and the foot-brake are similar to those in the 10-h.p. car, although, of course, the dimensions of these parts are larger. We would here take the opportunity of correcting a slight inaccuracy which crept into our columns, and would point out that the two connecting rods act upon the same crank-pin, and that, therefore, the pistons move parallel with one another in the two cylinders. The cam, moreover, which operates the contact spring in the commutator, has its two projections arranged opposite one another (not at right angles), and the coil which is employed has no trembler fitted to it.

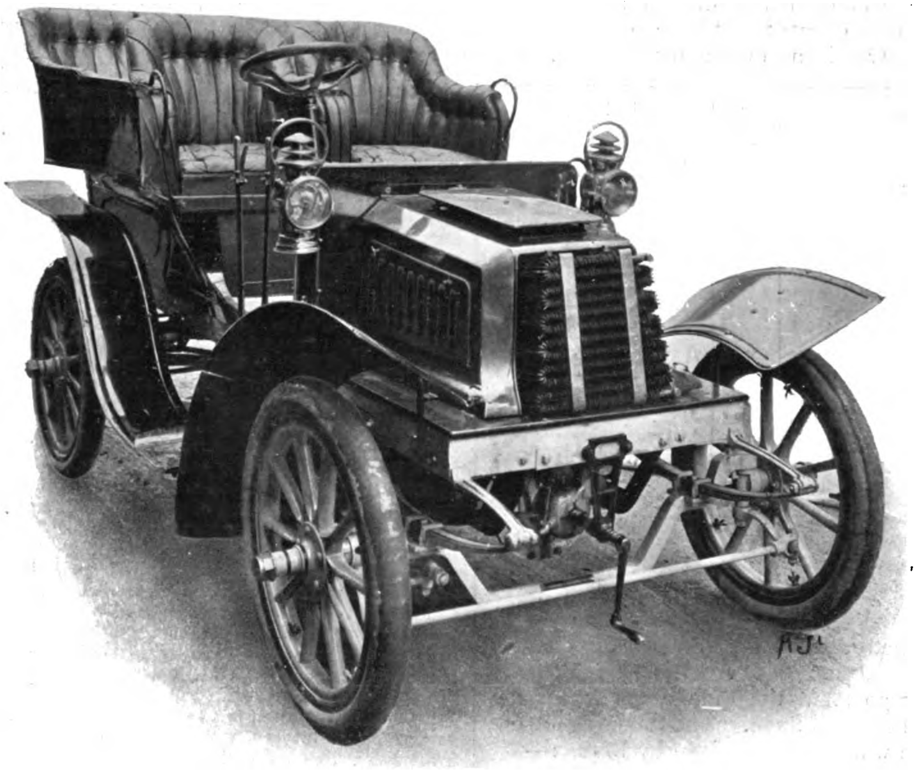


Fig. 1.—The Chenard and Walcker 14-h.p. Car.

The standard 14-h.p. tonneau is shown in Fig. 1, and the chassis is seen, both in side elevation and plan, in Figs. 2 and 3 respectively. The engine and the change-speed-gear are carried upon an angle-steel underframe, which joins the main steel and wood frame in front, and is attached to its longitudinal members by two brackets on either side. It will be remembered that the clutch is so constructed, with a double-faced male member, that it also acts as a footbrake when withdrawn sufficiently far by the brake-pedal for its other face to come into contact with a stationary brake-ring, and that a flexible jaw-coupling is introduced between the flywheel and the clutch. In this car the gear-box, A, is constructed in a very similar manner to that in the 10-h.p. car, except that it has no differential countershaft. The second-motion-shaft lies above the first-motion-shaft, and the sliding wheels provide four forward speeds and a reverse. The forward speeds are all worked by a side lever, and a separate small lever near the centre of the dash brings the "reverse" pinion into gear. The side lever is so arranged that the first speed is in gear when the lever is in its furthest position forwards, the zero notch comes next, and for the higher speeds it is drawn back, notch by notch, towards the driver.

The second-motion-shaft is connected, by means of the universally-jointed shaft, B, with a differential countershaft mounted upon the fixed rear axle. The countershaft and the axle are clearly shown in Fig. 4, where the short shaft carrying the driving bevel, B^1, is exposed to view, and has been removed together with that portion (C^1) of the casing which provides a bearing for it;

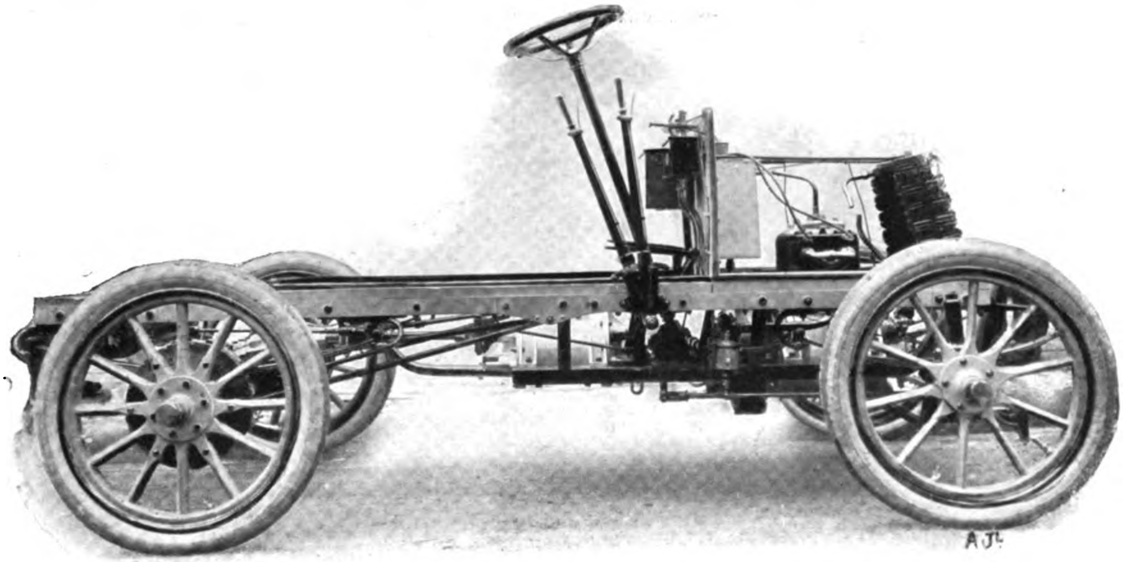


Fig. 2.—Side view of 14-h.p. Chassis.

one of the hub-drums, H, has also been removed. The casing enclosing the differential gear, D^1, and the bevel-gearing, is made of aluminium in three pieces, the other two portions, C^1, being bolted together and having a vertical joint between them. The two halves of the countershaft are supported in bearings in steel tubes, D, which entirely enclose them and which connect the casing, C^1, with the stationary axle, G, by means of the brackets, E^1, the discs, F^1, and the brackets, F^2. The aluminium castings, G^1, are constructed in such a manner that those portions of them into which the tubes, D, fit, can be clipped together by bolts so as to hold the tubes firmly in place. The shell of the differential gear, D^1, carries the larger bevel wheel, D^2, in much the usual way, and the driving bevel, B^1, meshes with it; as will be noticed, these wheels are of large size. The ends of the countershaft

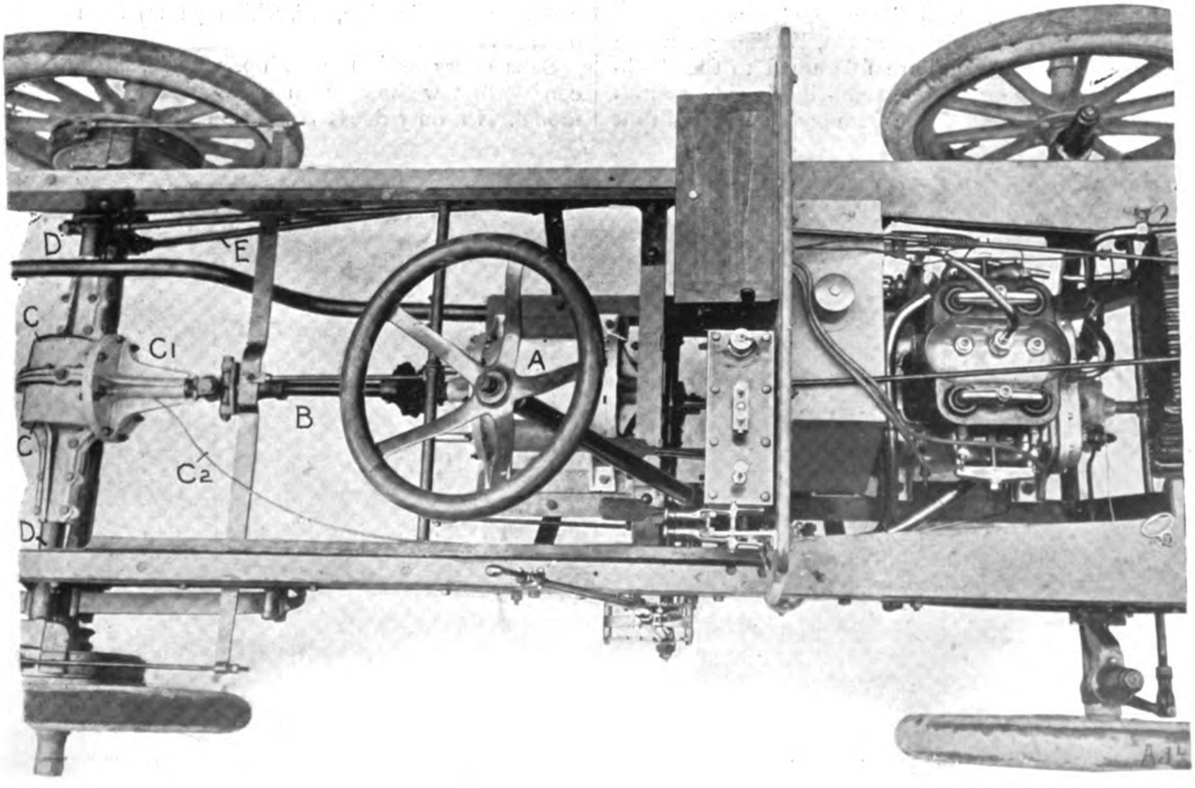


Fig. 3.—Plan view of 14-h.p. Chassis.

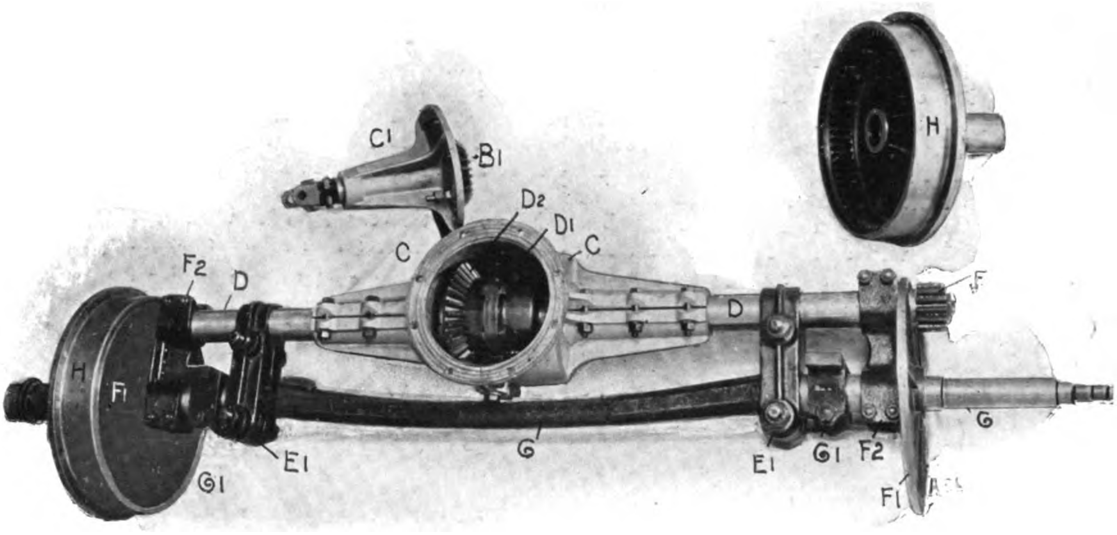
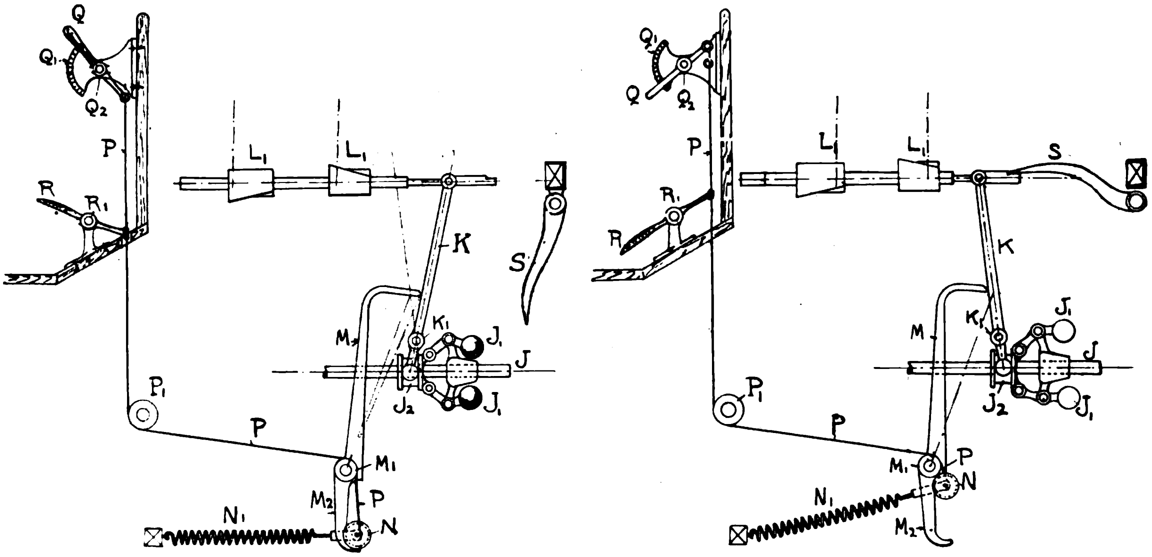


Fig. 4.—View of Rear Axle and Differential Countershaft.

have pinions, F, fixed to them, and these mesh with internally-toothed drums, H, which are formed in one piece with sleeves fitting over the stationary axle and forming the bearings for the road-wheels. The wheels are built up on these castings, and the outer surface of the toothed drums forms the surfaces for the band-brakes to operate upon. The discs, F^1, are turned so as to fit inside the drums, H, and the enclosed gearing therefore runs in a more or less dust-proof casing. The brackets, E, not only help to secure the tubes, D, to the axle, G, but they also receive the ends of forked distance rods, E (Fig. 3), which pass up to the main frame and are fulcrumed to the flitch-plates on its side members. The semi-elliptic side springs which support the rear end of the frame are connected to it by shackles at each end, and are clipped to the brackets, G^1, on the axle, G.

By this arrangement the rear axle, with the countershaft, is free to move relatively to the frame, subject only to the control exercised by the distance rods and by the side springs, and the whole weight of the rear portion of the car is taken on the stationary axle, G, and the wheels, no strain being imposed upon the countershaft, or upon the bevel-gear driving it. The whole of this rear mechanism is lubricated by a single pipe, C^2, which passes from a lubricator on the dashboard.

Satisfactory as is the 10-h.p. vehicle, we are bound to confess that we were even more pleased with the 14-h.p. model. Not only does the additional power available enable



Automotor

Maximum Speed Position. Minimum Speed Position, with Starting Catch, S, in use.

Fig. 5.—Diagrammatic views of Automatic Governor.

the car to be started on the fourth gear, which represents about 35 miles per hour on the level, but the manufacturers have so greatly improved the design of their automatic governing arrangements that we have no hesitation in saying that it is now the best-governed petrol engine which we have as yet seen. In the majority of engines now on the market, it does not follow that because a slight increase in speed commences to reduce the power of the engine, that the governor will continue to do so sufficiently without any further increase of speed. In other words, the action of the governor balls is not usually progressive, and, therefore, the speed of the engine increases perceptibly if the full load is thrown off. In the Chenard and Walcker engine, as previously described by us, it must have been evident to those who had given the matter consideration that the chances of faulty governing in this respect were even greater than usual, owing to the fact that the cam shaft had to be moved over a greater range by the governor than is necessary with a throttle-valve control. This we pointed out to the manufacturers at the Paris Exhibition, and it is with special pleasure, therefore, that we record the fact that all difficulty in this respect has now been so completely overcome.

The new governing device adopted will be clearly understood from Fig. 5, which diagrammatically represents the entire system, and in which the various parts are shown, both in the position which they assume when the engine is running slowly on no load and when it is being governed at the maximum speed permitted. In this illustration J represents the crank-shaft, J¹ the governor balls, and J² the sleeve which is moved longitudinally along the shaft by them. The sliding sleeve engages with the lower forked end of the lever, K, which is pivoted at K¹, and is connected at its upper end with the sliding cam-shaft, L. The tapered cams (illustrated on p. 155 of this Volume) which open the inlet valves at the beginning of the suction stroke, and close them at various times during that stroke, according to their longitudinal position, are represented by L¹, and the centre line of the inlet valve rods is also indicated. It will be understood that the action of the governor on the cam-shaft is to move it from right to left, and by so doing to cause the valves to close earlier and earlier during the suction strokes. The relative movement of the governor sleeve, J², and of the cam-shaft is about 1 to 5, and when the balls fly outward the centrifugal force exerted on them increases because of their greater distance from the centre. This enables them—since the force exerted against them remains constant, as will be seen—to move the cam-shaft throughout the *whole* extent of its range as soon as they commence to move it all. There is, of course, no danger of their over-governing to any serious extent, because the centrifugal force is also proportional to the *square* of the speed, and because any reduction of engine speed has, therefore, more effect upon them than that due to their increased distance from the centre of the shaft.

The force which is brought to bear against the action of the governor is derived from a very long spring, N¹, which is of sufficient length to exert an approximately constant pull under all the conditions under which it is used. It is at one end fixed to the car, and at its other end it is secured to a pair of grooved rollers, N, which ride upon a bifurcated arm, M², of a lever. The lever is pivoted on a stationary fulcrum, M¹, and its longer end, M, presses against the lever, K, as shown in the drawing. The rollers, N, naturally tend, owing to the pull of the spring, N¹, to travel along the arm, M², away from the fulcrum, M¹; but the rollers are also connected by means of a cord, P, with the hand-regulated lever, Q, and foot pedal, R, in such a manner that they can be drawn up towards the fulcrum, or allowed to recede from it at the will of the driver. The virtual pull of the spring, N¹, against the governor is in this manner varied, because the spring is given a greater or a less leverage over it, as required. When held in any particular position, its pull remains approximately constant, regardless of the position of the governor sleeve, J², or of the cams, L¹. If anything, the governor is more sensitive at the higher speeds than at the low speeds, because the force of the spring is naturally slightly more constant the nearer the rollers, N, are to the fulcrum, M¹, and the less the elongation of the spring, N¹, is in consequence.

The cord, P, passes round the pulley, P¹, and is attached at its further end to the one arm of a hand lever, Q, which is pivoted at Q², and moves over a notched quadrant, Q¹, on the dashboard. The normal speed of the engine depends upon the position in which the lever, Q, is placed and the actual speed does not, on the car which we have tested, vary appreciably with any variations in load within the power of the engine.

The foot pedal, R, which is pivoted at R¹, and is, at its other end, attached to the cord, P, moves in accordance with the hand lever, Q. If depressed, however, it reduces the normal engine speed, and is, therefore, the converse of an accelerator and may be termed a "moderator" For driving in traffic, the control which is obtained by means of these two regulators is particularly satisfactory; the normal speed of the car is adjusted by the hand lever, and any slowing up which may be necessary can be done with the foot on the pedal, R. If a complete stop is found to be unavoidable, the clutch can be withdrawn in a moment with the right foot, and a further depression of that pedal applies the brake; the result is that the hands are free for the steering wheel, and everything can

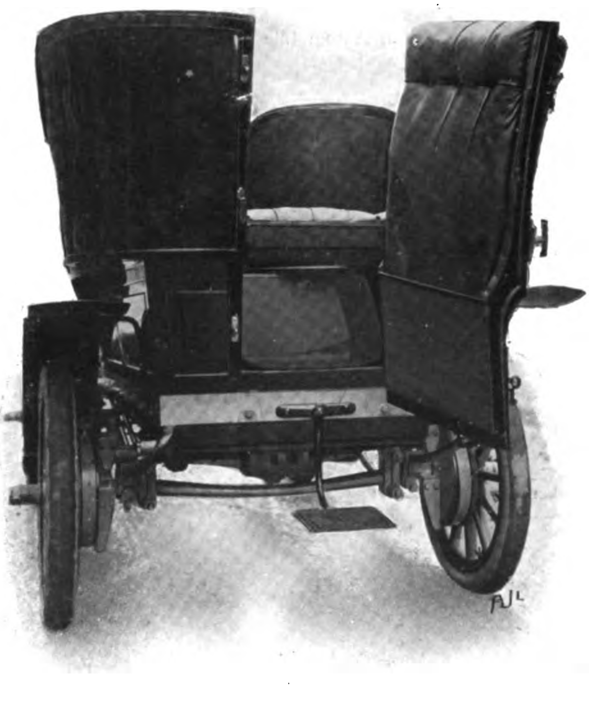


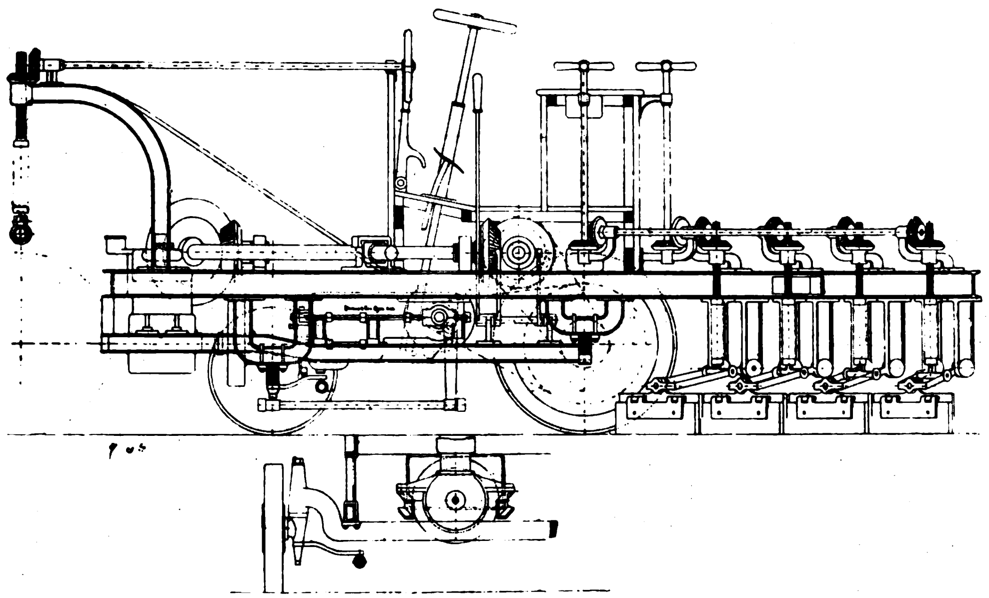
FIG. 6.—Rear view of 14-h.p. Chenard and Walcker Car.

be done with the two feet. The small stop, S, which is made of sheet metal, and is pivoted to the front of the main frame, is provided for holding the cams in their inmost positions when starting the engine. Although the action of the cams on the rods which lift the valves is to wedge them along in this direction, yet by this provision they are with certainty held in the desired position. The catch is of course thrown out of engagement with the cam-shaft as soon as the engine is running.

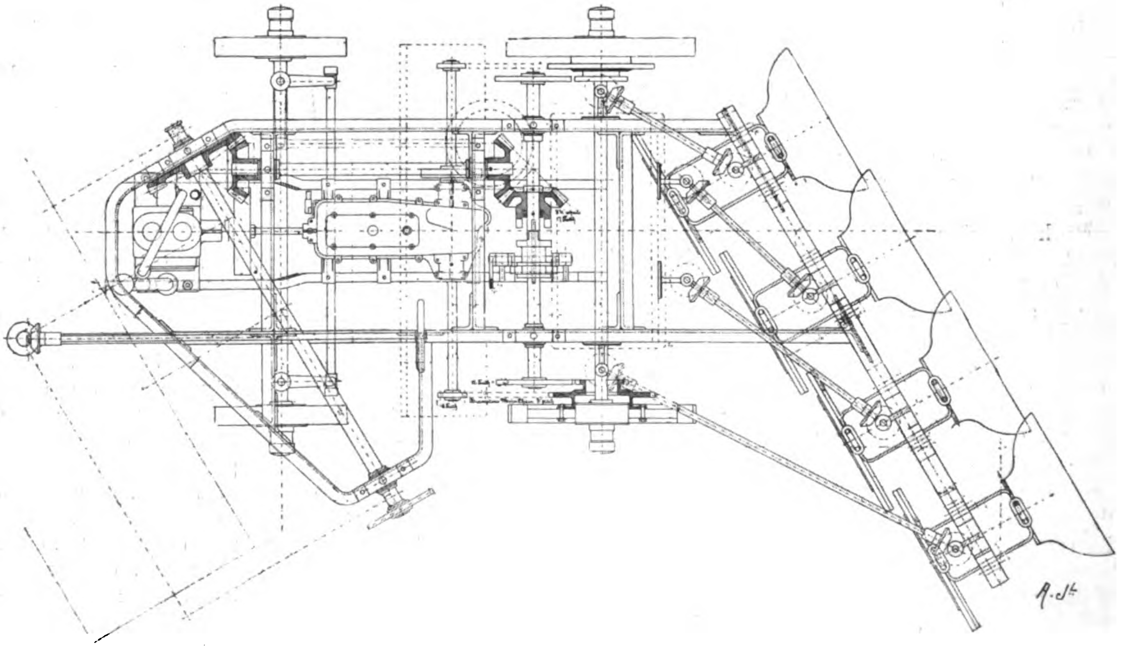
The 14-h.p. car is fitted with a very comfortable and well-finished roomy tonneau body, and has a third seat behind. A rear view, with the door open, is given in Fig. 6.

A SELF-PROPELLED ROAD CLEANER.

THE accompanying illustrations represent a machine which has been designed for municipal purposes and, whilst combining four distinct instruments, is intended for use in the hands of one man. The vehicle itself is constructed with a main frame of channel steel, having a large cross section, and an underframe which serves to stiffen the two axles and to carry the motor, main clutch, and change-speed gear, which are arranged in relation to one another, much as on chain-driven cars. The rear wheels are driven by side chains passing from sprockets on the ends of a differential



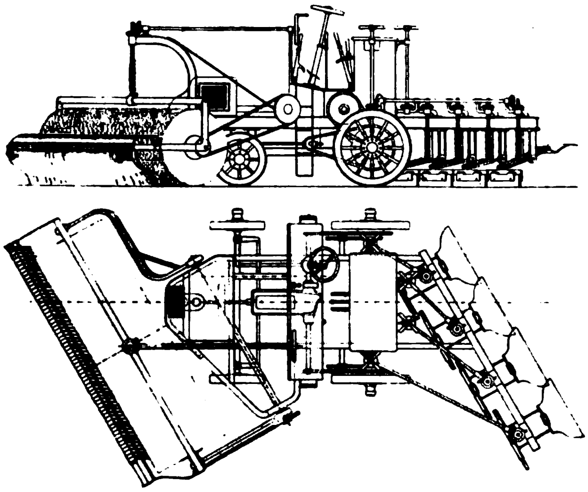
Side elevation and part front elevation of Automobile Road-Cleaner—the Brush and Rakes removed.



Plan of Automobile Road-Cleaner—the Brush and Rakes removed.

transverse countershaft. The steering gear also resembles that adopted on most automobiles.

The main frame is so constructed that it carries a large revolving brush in front (on the left in the drawings), the axis of which is at a suitable angle to the direction of travel, to enable it to sweep the dust on the road to one side, as in ordinary road sweeping machines now in use. The weight of the brush is taken by a crane-arm fixed to the frame, and the brush can be raised or lowered by a hand-wheel in front of the driver, a shaft passing from it connecting it with bevel gearing, as seen in the drawings. The brush is driven by a chain from a horizontal shaft on the main frame, and this shaft is connected by bevel gearing and chains with both rear wheels. The power is, in this design, therefore transmitted by one set of chains to the driving wheels, and that part of it which is required for revolving the brush is again transmitted back to another countershaft on the frame by other chains. It would, we think, be preferable to obtain the necessary power for driving the brush in a more direct manner, and we see no reason why this should not be easily done, thus gaining in efficiency and simplification of parts. A series of small rakes are mounted immediately in front of the brush, and are intended to break up any hard mud on the road, and to loosen it so that the brush can deal with it.



Side and plan views of Petrol Road-Cleaner.

At the rear of the frame four squeegees, lying at an angle to the frame and overlapping one another, are mounted in such a way that they can be brought into contact with the road separately or collectively from the driver's seat. Immediately behind them are four similarly arranged scrapers, these being capable of employment alternatively with the squeegees.

This machine is the invention of Mr. F. Sadler, who has been assisted by Mr. H. G. Burford, particularly in connection with the propelling mechanism.

None of these machines have as yet been made, but we understand that those borough surveyors before whose notice it has been brought regard it with considerable favour. There can be no two opinions concerning the utility of such a road-cleaner, provided that it fulfils the expectations of its inventor in practice. The design in its present form is, of course, somewhat crude, but except for one possible difficulty we see no reason why it should not work well, we refer to the tendency which there is for the brushes and other implements to cause the wheels to skid owing to the angle at which they are necessarily placed. We wish the inventor every success with his invention.

POLICEMEN ON MOTOR BICYCLES.

There are some wiseacres who always are anxious to copy the methods employed on the Continent, quite irrespective of their inherent merits. Some of them now desire to follow the example set in Paris, by arming the police with motor bicycles to enable them to overtake and capture recalcitrant cars which refuse to stop when called upon to do so in the name of the law. We conclude from this that it has been discovered that the two policemen of Highgate who asserted on oath that they were able to run respectively at the speeds of fifty and sixty miles an hour, are exceptions in the force. The conception of an English policeman, mounted upon a motor bicycle and pursuing an offending car, opens a vista of possibilities of which the illustrators of our comic papers might take advantage. If the car is going above the legal limit, the policeman will be going above the legal limit, too, otherwise he will not be able to overtake the car. We challenge anyone to dispute this statement. Why should not the car driver when finally run to earth take out a summons against the policeman for going at precisely the same pace, or rather faster than himself? Besides, modern cars can run a good distance without stopping—100 miles is nothing to them. If all the policemen are to be armed with motor cycles, and are to pursue cars which they allege refuse to stop, they will always have nice excuses for a pleasant outing and neglecting the cabbages of Lord Onslow and other people, and many other of the duties for which, before the advent of the automobile, they were presumed, possibly by a "legal fiction," to be paid. Then there is the question of accidents, too. In a race or a chase people are likely to be careless of life and limb, both their own and other people's. A policeman who was thus pursuing a car for running over, say a dog, and in his turn had the misfortune during the excitement of the chase to collide with an old woman, would be in an awkward position. Police constables are only human after all, though those who have observed the wonderful precision with which they corroborate one another as witnesses in police courts might be disposed to doubt it. What if the constable himself took to flight and outdistanced the car he was pursuing, would the car which had run over a dog be justified in pursuing a policeman who, in attempting to capture it, had capsized an old lady? We leave the problem to our readers.

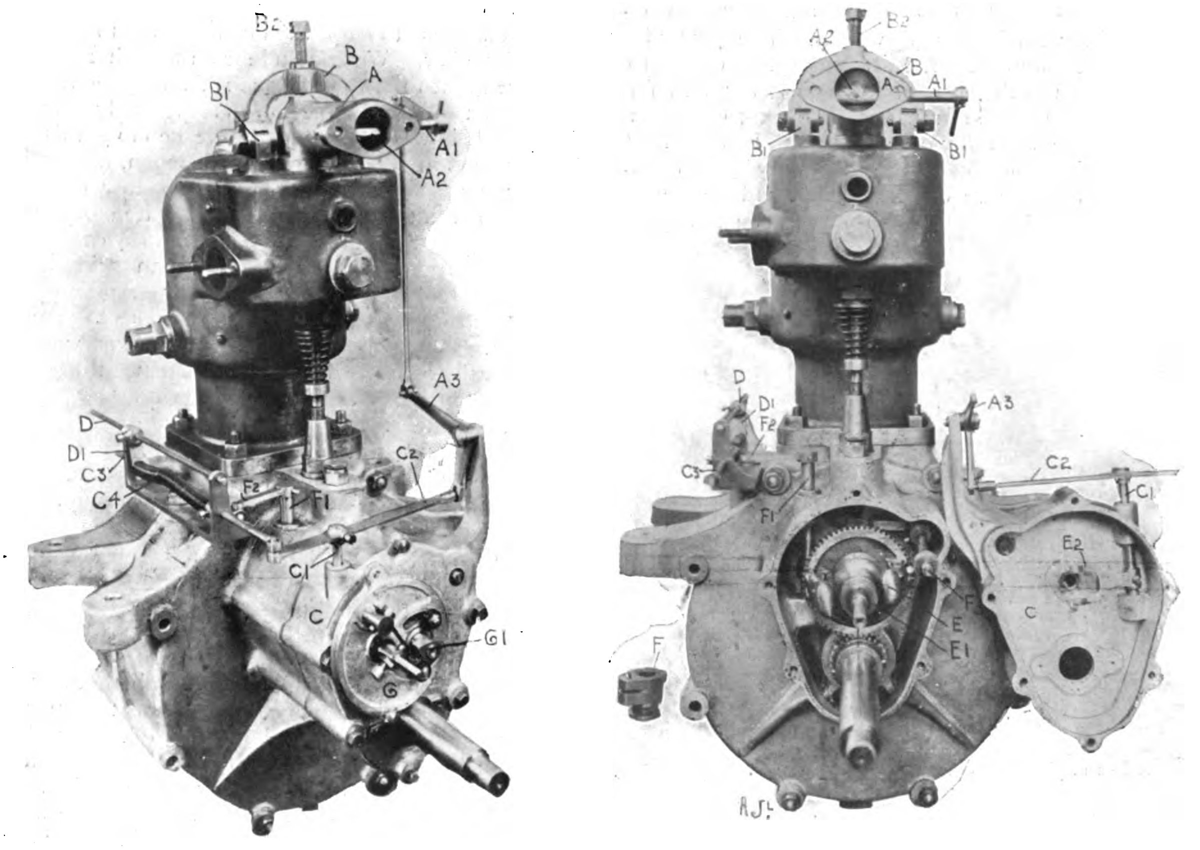
Mr. Marconi was the first to combine a wireless telegraphy outfit with a motor car, and now his rival, the De Forest Wireless Telegraph Company, has equipped an electric automobile in a similar way. It was sent in to Wall Street (New York), and transmitted wireless market reports to the offices both of the *Wall Street Journal* and of brokers in the neighbourhood. A two-inch spark coil was found sufficient for transmitting over the moderate distances involved, and it is stated that the idea will be generally extended, particularly for the purpose of reporting races and for the use of any persons who may wish to maintain communication between their house and the city.

THE ANNUAL AGRICULTURAL HALL EXHIBITION.—Part III.

Reference has already been made to the exhibit of the Rex Manufacturing Company, and we now give an illustration of one of the latest 16-h.p. vehicles turned out by them. We also show two views of the automatically governed single-cylinder engine, which is the latest improvement they have adopted. In one of these views the engine is shown complete, and in the other the casing surrounding the governor and the half-compression cam have been detached, enabling them to be seen separately; these illustrations are rendered self-explanatory by the legend given beneath. A large number of well-known Continental manufacturers were represented by their English agents, and generally the latest models were to be found upon the stalls, and in many cases sample chassis enabled the visitors to make a thorough inspection of the mechanism. Most of the machines referred to are already known to our readers, and have been described by us on previous occasions. A sample of the Delahaye car was shown by the Chief British Depôt. Rochet and Schneider vehicles were again exhibited by Captain Deasy, and the Graphic Engineering Company again had several Deschamp cars on their stall.

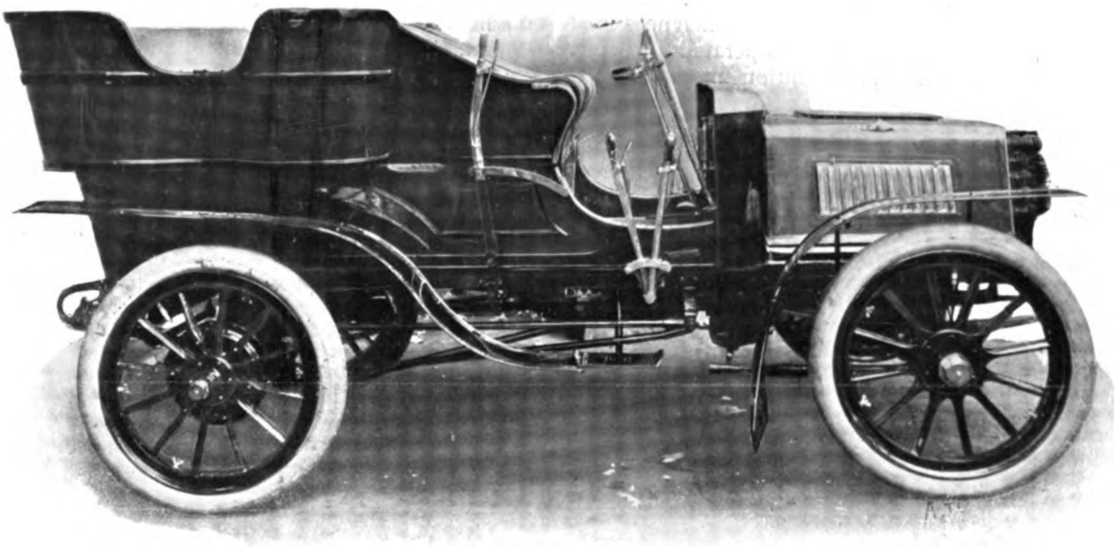
Amongst the well-known firms who were once more in evidence at the Show, mention should be made of C. S. Rolls and Co., the Great Central Garage Company, the London Motor Garage Company, and Mr. O. C. Selbach, the last-mentioned showing for the first time a 24-h.p. car in addition to the smaller Rigal vehicles and numerous accessory parts which were well to the fore at the Crystal Palace. Gobron-Brillié cars were on this occasion exhibited by the Gobron Motor Company, who have now taken up an agency for them, and have made the necessary arrangements for pushing them over here. The Weston Motor Syndicate, with their Chenard and Walcker vehicles; the Motor Car Company, with the Decauville; Mann and Overton, with their Georges Richard cars, all had attractive stands.

The latest Decauville chassis has again undergone improvements since the Paris Salon, and we have already referred to the manner in which the engine and gear-box are now secured to the stamped steel frame. The exhaust pipe fitting leading from the four cylinders to the exhaust pipe



10-H.P. Rex Single Cylinder Engine with Governor and Half-compression Cam.

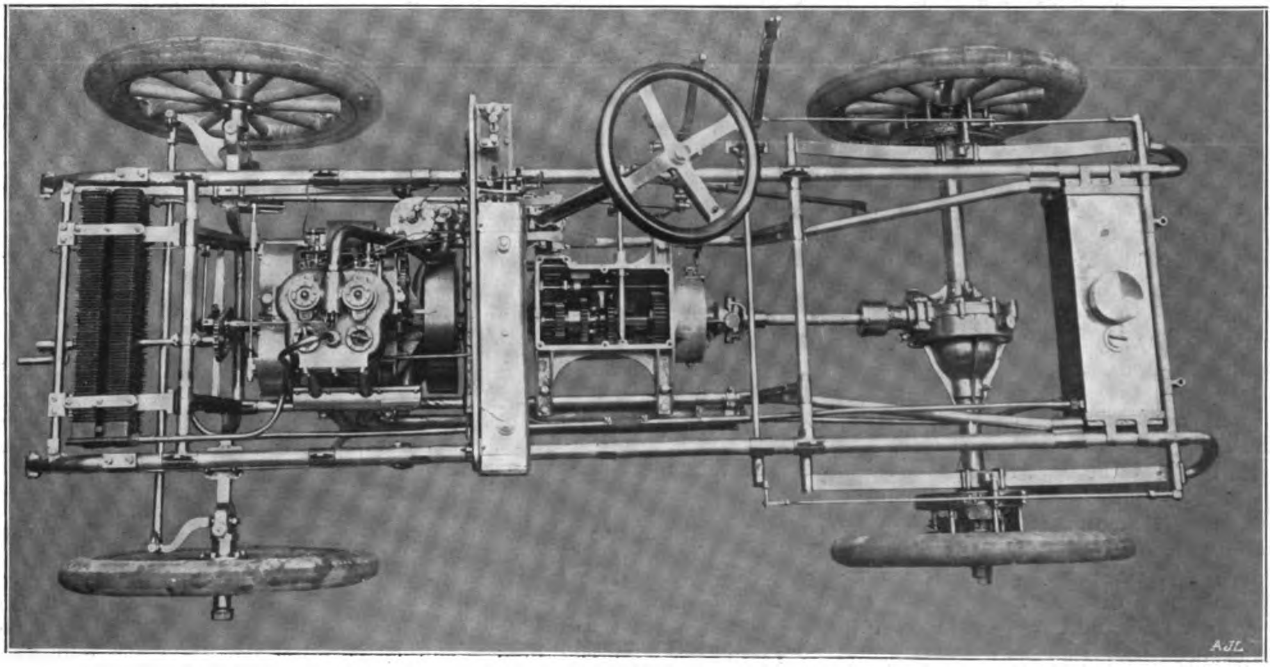
A, induction-pipe fitting.
A^1, throttle valve spindle.
A^2, butterfly valve.
A^3, bell crank lever.
B, yoke.
B^1, hinges for yoke.
B^2, set screw holding valve in place.
C, removable casing enclosing governor.
C^1, projecting spindle carrying lever, C^2.
C^2, lever operating bell-crank, A^3, and throttle valve.
C^3, sliding rod connected to lever, C^2.
C^4, spring acting against governor.
D, accelerator rod.
D^1, plate fixed to rod, **D**, and pressing against spring, C^4.
E, half-speed gear wheel.
E^1, sliding sleeve of governor.
E^2, fork engaging with E^1.
F, exhaust and half-compression cam.
F^1, spindle engaging with cam, F.
F^2, half-compression lever.
F^3, rocking spindle with arm between cam and valve spindle.
G, contact breaker.
G, cam operating contact spring.



A 16-h.p. Rex Car.

has been reconstructed so that easy bends are now provided, thus removing the objection which we raised in our Paris Exhibition article. An expanding brake having cast-iron segments pressing on the inner faces of the steel drum, is now fitted on the longitudinal shaft behind the gear-box, and there are no longer two sets of band brakes operating on the hubs of the rear wheels. The steering gear has also a more substantial construction, and a few more minor changes have been made.

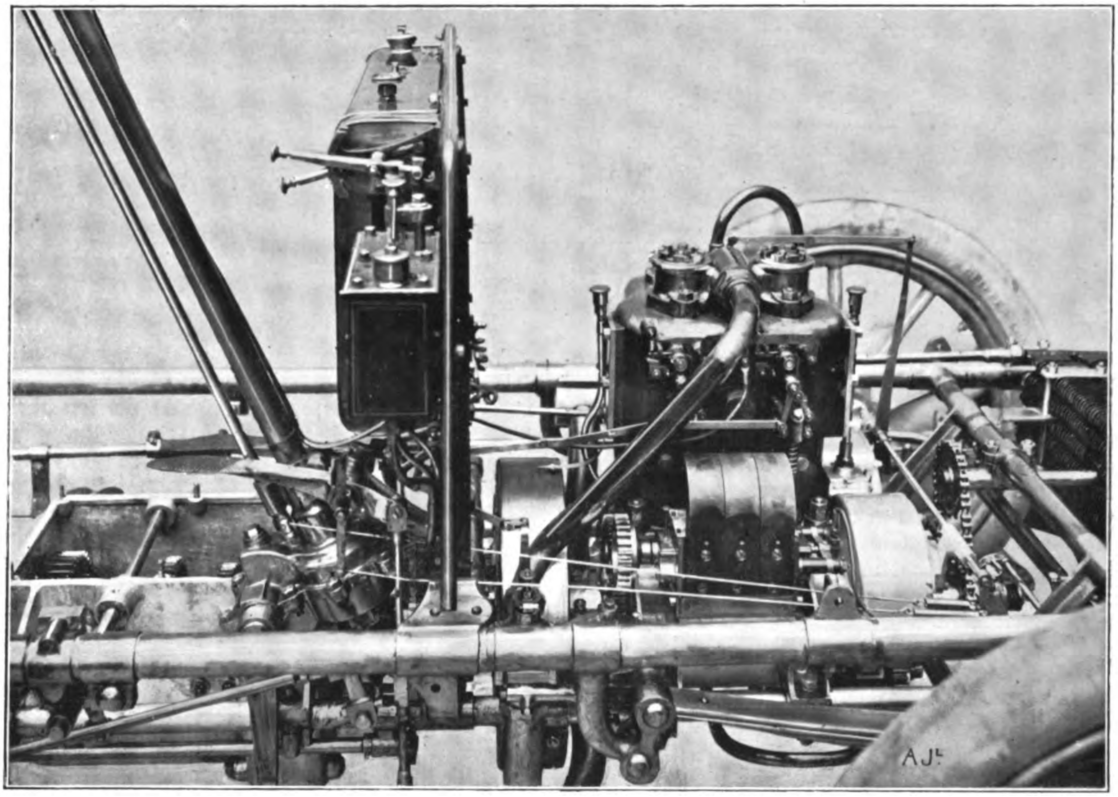
We give two illustrations of the latest 12-h.p. Georges Richard chassis, one being a plan view, and the other showing the engine, the dash, and a portion of the gear-box. The framework of this car is tubular throughout, and the engine and the gear-box are carried upon an underframe, the longitudinal members of which join the side members of the main-frame behind the rear axle. The engine is of the twin-cylinder type, with atmospheric inlet valves arranged centrally above the cylinders, and with inspection plugs placed



Plan View of 12-h.p. Georges Richard Chassis.

over the exhaust valves. It is fitted with a low-tension system of ignition, the timing of which can be varied from one of the levers on the dashboard. The magneto is of the rotary type, and the igniters are operated by cams on a separate cam-shaft. The ignition mechanism is seen in a separate illustration, where the method adopted for varying the moment at which the spark occurs in the cylinder is clearly seen. Referring to this photographic reproduction, F is an insulated terminal which passes through the wall of the cylinder, and is connected with the magneto by the wire, F^1. The spindle, E, also passes through into the cylinders, and is free to rock about its axis, so that a projecting arm on its inner end can be brought into contact with the insulated contact, F. The contact points are normally held apart by the spring, E^2, and are brought together when the cam, A^1, on the cam-shaft, A, has lifted the sliding rod, B, against the action of the spring, B^1. The rod, B, is carried in guides as shown, and it is provided at its upper end with a specially-shaped catch piece, C, pivoted to it at C^1. The piece, C, has a tapered profile which rubs against the surface of the cam, D^1. As the rod, B, is forced upwards by the cam, the upper end of the piece, C, comes into contact with a projection, E^1, on the rocking contact piece spindle, E, and its wedge-shaped side also comes into contact with the cam, D^1. The result is that the spindle, E, is caused to rock a certain distance left-handedly against the action of the spring, E^2, and that the cam, D^1, forces the piece, C, clear of the projection, E^1, as soon as the rod, B, has been lifted a certain distance. By this action the necessary spark is produced in the cylinder, and a very quick "break" is secured. The actual instant at which the spark occurs depends upon the shape of the cam, D^1, and the moment at which it forces the pivoted piece, C, away from the projection, E^1. The cam, D^1, can be moved about its axis by the lever, D, which is connected with one of the hand levers on the dashboard. The two igniters are operated simultaneously by the driver.

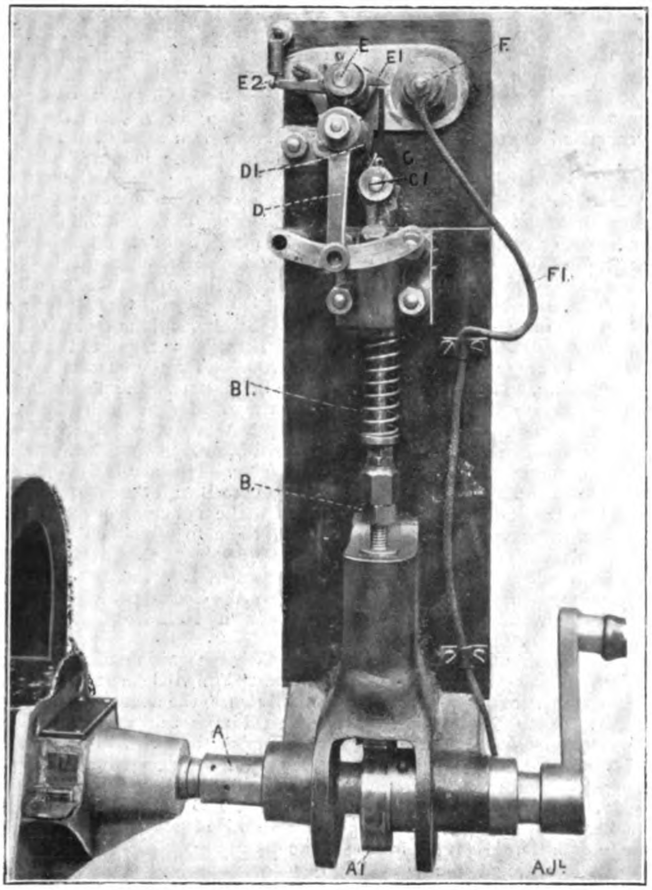
The carburettor employed is of the float-feed spray type, but differs in many respects from those now on the market. The throttle-valve is formed round the spray nozzle and is operated from a hand-lever on the dash which moves the spraying cone to various distances from the jet. The change-speed gear provides four forward speeds and a "reverse," the last mentioned being operated by a separate lever, and a direct-through-drive being obtained on the top speed. When the reverse is in use the intermediate wheel through which it is obtained is securely locked in its correct position; the mechanism which thus ensures that the spur-wheels shall be properly in mesh is ingenious. The lay-shaft in the gear-box lies immediately beneath the direct-through-shaft. The power is transmitted from the gear-box to a live-rear-axle through a universally-jointed shaft, and a metal to metal band-brake is fitted immediately behind the change-speed gear. Semi-elliptic side springs are employed, and those at the rear are attached to the frame with shackles at their back ends only, so that no distance rods are needed for tie-ing the axle to the frame. The cylinders have a bore of 104 mm. and the stroke is 100 mm. The speed of the engine is automatically regulated by a centrifugal governor connected with a throttle valve placed between the inlet valves. The car



Part of 12-h.p. Georges Richard Chassis.

attains a speed of up to about 35 miles per hour on the level, and it is well designed and of good construction throughout.

We did not notice anything very novel in the way of American petrol cars, but the majority of the well-known types were again on view. The Anglo-American Motor Car Company showed the Winton and the Oldsmobile, and the Petrol Power Company again exhibited Peerless and Rambler vehicles.



Georges Richard Low-Tension Igniter.

(*To be continued.*)

ATMOSPHERIC VERSUS POSITIVELY ACTUATED VALVES.

The relative merits of mechanically actuated *versus* atmospheric admission valves still continue to excite a high degree of interest, though agreement between the supporters of the one system and the champions of the other would appear to be as far off as ever. The well-known Peugeot firm have communicated certain experimental data on the subject to *L'Auto*. Assuming that these are correct they certainly seem to show that, at any rate, in the case of the particular Peugeot engine experimented with, more power was obtained at high speeds with the positively actuated valves than with the atmospheric variety. Of course it must be understood that these results only apply to the particular class of engine with which the experiments were made, and we do not even know how far they hold good for the Peugeot engines generally. Nor does our esteemed contemporary, *L'Auto*, actually vouch for the facts, so that we are compelled to give them entirely on the responsibility of the Peugeot firm.

The experiments were conducted at the Lille works with a 6-h.p. motor, the speeds being varied from 1,000 to 1,400. With atmospheric valves the power yielded by this motor was, at 1,000 revolutions, 4½-h.p.; at 1,250 revolutions, 5·6-h.p.; and at 1,400 revolutions, 4·93-h.p. Up to 1,250 revolutions the power of the motor with the atmospheric valve rose steadily and regularly, but after that speed was reached it diminished with equal regularity and, approximately, equal speed.

Another series of experiments were tried with the same motor, arrangements being introduced for opening the admission valves positively. We assume that the size of the valves remained the same, though this is nowhere expressly stated in the firm's communication. With the positively actuated valves the powers obtained were 4·9-h.p. at 1,050 revolutions, 6·9-h.p. at 1,250 revolutions, and 6·8-h.p. at 1,400 revolutions, and the rise in power is practically equable up to the 1,400 revolutions, and would apparently continue to increase even beyond that speed. Thus, according to the Peugeot people, the range of the motor is increased as well as its power at all speeds. The engine with which these experiments was made had two cylinders of 80 mm. bore by 90 mm. stroke.

Exactly the opposite point of view is taken by the equally well-known De Dion-Bouton firm, who have addressed to us a communication in which they maintain the undoubted superiority of the atmospheric valve, and bring a variety of accusations against the method of positively actuating admission valves. Messrs. De Dion-Bouton sum up the advantages stated to be characteristic of the positively actuated valve as follows:—(1), that the valve makes less noise; (2), that the power of the motor is increased thereby; and (3), that the valves always lift at the same time and remain so lifted during the whole effective period.

The firm traverses each of these three statements. The first statement they categorically declare to be false, as the valve being fitted with a stronger spring is bound to make more noise when closing. At best it is merely a case of replacing one noise by another.

As regards the alleged increased power of the motor, they maintain that nobody has ever proved this to be the case in practice and by means of figures. This is, of course, controverted by the figures we give above on the authority of the Peugeot firm. Messrs. De Dion-Bouton declare that they have made exhaustive experiments with one of their ¾-h.p. motors, and that they obtained less power with positively actuated valves than with atmospheric ones. This is, however, to some extent explained by the manner in which they combat the statement that positively actuated valves always open at the same moment. If the adjustments are not such that they do so, of course the full power will not be attained.

Finally, Messrs. De Dion point out that with positively actuated valves there is a danger of the entering mixture, when rapidly expanded by the hot cylinder, making its exit through the admission valves, thereby occasioning a loss of power and waste of fuel.

French automobile interests will be well cared for at the St. Louis 1904 Exhibition. M. Rives has been appointed Hon. President of the special committee appointed to deal with the Automobile Section. M. Jeantaud is President, and MM. Darracq, Max Richard, Kelner, and Pozzi, Vice-Presidents.

THE SOCIETY OF MOTOR MANUFACTURERS AND TRADERS.

THE first annual banquet of this young but very vigorous Society was held at the Grand Hotel on the 3rd instant, when Sir John I. Thornycroft, F.R.S., presided. An excellent menu was gone through to the accompaniment of a good programme of music. Amongst those who supported the Chairman were Earl Russell, the Hon. John Scott Montagu, Messrs. S. F. Edge, Mark Mayhew, L.C.C., Capt. Somerset, Messrs. F. Schenk, W. Worby Beaumont, J. E. Thornycroft, H. Niblett, E. M. C. Instone, H. Austin, H. Belcher, Sidney Straker, L. R. L. Squire, Saunders, E. Clare, H. G. Burford, A. C. Hills, E. W. Hart, T. Clarkson, Capt. H. H. P. Deasy, Messrs. R. D. Dundas, W. C. Bersey, Stanley Spooner, E. H. Arnott, Frank Lanchester, F. Atherley, C. Watney, A. Burgess, Oliver Stanton, R. E. Phillips, B. Nadall, Ed. Mercer, A. A. Godin, G. A. Burls, W. I. Leonard, J. W. Stocks, Wm. du Cros, G. H. Smith, F. W. Bailey, H. A. Blackie, J. H. Thrupp, Jesse Ellis, F. J. Beadle, J.P., G. T. Harratt, Walter Munns, A. E. Perman, A. M. H. Solomon, A. C. Kenealy, G. W. Cooper, H. Johnson, A. G. New, Major F. L. Lloyd, R.E., T. P. O'Connor, M.P., E. J. Halsey, J.P., W. B. Keen, Chas. Jarrott, J. E. Hutton, A. W. Robinson, W. M. Letts, Cecil Edge, Chas. Sangster, W. C. White, F. W. Peckham, F. Coleman, G. Williams, and the Secretary, Mr. W. F. Woodfine.

Altogether about ninety guests were present, and the solemn and awe inspiring methods of the Toast Master, when demanding silence for the various toasts, was a distinct feature of the evening. The Toast of the King and the rest of the Royal Family having been duly honoured, the Hon. John Scott Montagu, M.P., in the unavoidable absence of the Right Hon. A. J. Balfour—whose regrets for his absence, and wishes for a successful evening he conveyed to the company—proposed the Toast of the "Automobile Industry." Mr. Montagu said that however much they regretted Mr. Balfour's absence, he was pleased to see many of the automobile leading lights with them. He thought that automobilism would assist rural England better than any system of import duties by giving access to markets and competing with railroads. The Prime Minister of the future who owned a Gordon-Bennett winner, would eclipse, he thought, the popularity of the Prime Minister who owned a Derby winner. Speaking as an owner of land he thought motor cars would be the salvation of the landowner by the economical conveyance of produce. All rail-borne traffic must first be road-borne, which meant extra cost. Automotors could therefore look to secure a very large proportion of this road-borne traffic amounting to four thousand million sterling. If they only secured half it would be more than sufficient to occupy them for their time. He protested against Mr. Henley's reference to the automobile as "unhandsome and shapeless" in his recently published poem. It was a matter of what the eye was accustomed to. Referring to the transport scheme of Lord Iveagh and Mr. Pirrie, into which he believed the automotor would largely enter, he was satisfied that Ireland never has had and never would have a greater friend than the motor car. He concluded by wishing prosperity to the automobile manufacturers, and advocated their joining together firmly for their mutual interests. Until they were unanimous in their views as to the policy for the trade, there was no chance of obtaining Royal patronage to an automobile exhibition.

Mr. S. F. Edge, in replying to the toast, said the industry promised to be of such huge proportions that there was room for all likely to come. He reviewed the various forms of automobile from the motor bicycle upwards, and drew attention to the possibilities for the supply of light cars, mentioning the fact that there were 400,000 licences paid in one year for dogcarts and for small carriages of the same nature which the light car was destined to replace. In regard to heavy cars, a commercial friend of his had three steam lurries and trailers and one petrol lurry at present at work, which had for the delivery of goods a radius of 40 miles. These four vehicles had taken the place of 32 horses, with a radius for delivery of goods of 12 miles only. He maintained the development of the motor car would help the farmer, because in the near future there would probably be an enormous increase in heavy vehicles, and the question of manufacturing the fuel at home would have to be seriously considered in the interests of the agricultural community. Instead of using American and Russian oil he advocated the study of producing alcohol from beetroot and potatoes, when a handsome return could undoubtedly be given to the farmer if a commercial alcohol could be produced, and were permitted by the Government. The demand for high class springs, coils, sparking plugs, &c., had brought forward the supply from British makers, and he was glad to say that these could now be produced in this country better than anywhere in the world. Mr. Edge paid a tribute to the work done by the Automobile Club for the movement, and to the voluntary workers who had combined to forward the industry in this country. It was leading to what we all desired, viz., making London the great buying and selling centre of the world—a consummation to be striven for by everyone interested in the undertaking.

Mr. T. P. O'Connor proposed the "Society of Motor Manufacturers and Traders," his delightfully humorous remarks, as usual, being followed by continuous peals of appreciative laughter. He mentioned a few dates in connection with the formation of the Society and its rapid development, and emphasised the great importance of unity of action amongst the manufacturers, and of holding one Exhibition only, in like manner to the Paris Salon, in which representation of the whole industry was embodied. He was pleased to announce that the gate money at the Crystal Palace—a very potent factor—had added, as a payment on account of the profits, £1,500 to the funds of the Society, and for next year practically all the floor space had already been allotted or applied for. The exhibits would show an enormous increase in the display of heavy and commercial motor vehicles. The villages, he said, must be aroused from their sleep of centuries. It was to the automobile that they must look to bring this about. Referring to the Land Bill and the transport scheme of Lord Iveagh and Mr. Pirrie, he thought they would mark the dawning of a new era for Ireland, and be an example which would probably be speedily followed in many other parts of the country.

Mr. F. R. Simms, in acknowledging the toast, said that he felt that the policy of the Society had been the right one, and the thanks of the industry were due to the Committee of Management, and to the indefatigable energy of the Secretary, in working for the success of the undertaking. He foreshadowed at some future period the possibility of an Exhibition in December and another in March, each of a distinctive nature, but the time, he thought, was not yet ripe for that. The profits of the Crystal Palace Show had been £5,000, of which one-third came into the coffers of the Society. He could not entirely endorse the opinion of Mr. Edge in regard to British component parts, and he advocated the closer attention of makers of component parts to the perfecting of this important section of the automobile movement, as the ideal motor car of the future was largely dependent upon this vital point.

Sir John Thornycroft then presented to Mr. Edge, in the name of the automobile industry, the Gold Medal of the Society which had been voted to Mr. Edge for the great services he had rendered in 1902 to automobilism.

Mr. Edge, in thanking the Society for their recognition of his work, said that enough had been heard of the past Gordon-Bennett Race, and what they had now to do was to look forward to the next race.

Mr. Sidney Straker, who was entrusted with the toast of "The Guests," mentioned that the Society, in conjunction with the Chamber of Commerce, proposed to move in the matter of getting the tare limit altered for heavy motor vehicles, as the Automobile Club was too much occupied with the lighter form of vehicle to give adequate attention for the moment to the relief from restrictive legislation of the heavy motor vehicle. Heavy vehicle contractors had great difficulties to contend with owing to the boycotting by the insurance and dock companies. It would be their object to overcome these obstacles.

Earl Russell, in reply, drew attention, as a member of the Roads Improvements Association, to the importance of the road question to automobilists. He thought the awakening up of the country was begun by the bicycle, and he thought it would be completed by the motor car.

Mr. E. J. Halsey, the chairman of the Surrey County Council, also, responding for this toast, stated he was the unfortunate individual who started the whole of the numbering and identification of cars question when he wrote to *The Times* in 1899. At that time he had not the remotest idea he would ever be connected with the industry, but he had been bidden, and there he was. All County Councils, he said, were practically agreed that the limitation of speed should be abolished, subject to due regard being observed for the safety of the public, and the carrying of some means of identification. It was a difficult question, and he thought each car should have a plate with the owner's name and a number, like a pleasure boat, but he should be very sorry to have to decide which was the best method to adopt. He protested against the County Councils being saddled with the injustice of instigating the prosecutions throughout the country for exceeding the speed limits. The police were responsible, and not the magistrates or the County Councils. The law prescribed a limit of 12 miles an hour, and so long as the law existed it was the duty of the police to see it carried out, and that of the magistrates to enforce penalties. The proper method was for them to unite and get the law altered, to which end he believed all the County Councils would assist them. He advocated a system of motors for the masses, that is, cars capable of travelling 20 or 25 miles per hour, which would be suitable for ordinary roads and traffic, instead of 40 and 50 miles per hour cars of which so much was heard. He felt sure that then the movement would receive greater support from the Government and officials throughout the country.

A hearty vote of thanks to the chairman, upon the proposition of Mr. Charles Jarrott, concluded the evening.

The Society of Motor Manufacturers and Traders' Medal presented for the first time last Friday to Mr. Edge. On the reverse side is a laurel wreath and the words: "Presented to Selwyn Francis Edge in recognition of his great services to British Automobilism in winning the Gordon-Bennett Cup Race, 1902, on a Napier Car."

IMPORT DUTIES ON MOTOR CARS.

THE *Board of Trade Journal* publish a list of the Customs duties charged by various countries on automobiles, from which the following particulars are compiled:—

In Russia vehicle and motor are charged separately, the former at a rate varying between £7 12*s.* and £25 1*s.* 7*d.*, according to size, the latter at 13*s.* 9*d.* per cwt. But if it be impossible to separate vehicle and motor the weight of the latter is reckoned at 30 per cent. of the whole, and charged for accordingly.

A similar system prevails in France, motor and vehicle being taxed separately, but when these are inseparable the trade car counts as all motor (charged 4*s.* 10½*d.* to 32*s.* 6*d.* per cwt.), and the pleasure car as all carriage (charged 2*s.* 5*d.* to 48*s.* 9*d.* per cwt.). Italy has a like system (carriage 33*s.* 7*d.* to £13 4*s.*, motor 4*s.* 10½*a.* to 10*s.* 2*d.* per cwt.).

Spain makes no difference between carriages with motors and carriages without, but the rates are heavy—£12 10*s.* to £40.

Austria bases her tariff on the upholstery of the carriage and the percentage of metal, having an intrinsic value, in the motor. A car with leather work or upholstery costs £7 8*s.* 10*d.*, as against £2 9*s.* 7*d.* without, and in addition a motor containing less than 50 per cent. of valuable metal costs 12*s.* 1*d.* per cwt., as against only 5*s.* 0½*d.* to 7s. 6½*d.* for the more valuable article.

Germany charges 4*s.* 1*d.* per cwt. gross, Switzerland 8*s.* 2*d.* per cwt. passenger and 2*s.* 5*d.* for trade cars, and Norway 8*s.* 6*d.* per cwt. Belgium charges 12 per cent. ad valorem, but will take nothing from travellers visiting the country. The charge in Portugal is £27.

The British possessions charge as follows:—

FREE—Straits Settlements, Hong-Kong, Falklands, Gibraltar, and Malta.

India, 5 per cent. ad valorem; Ceylon, 5½ per cent.; Transvaal, 3 per cent. transit duty and 7½ per cent.; Canada, 16⅔ per cent.

20 PER CENT. ad valorem—Cape Colony, Natal, Orange River Colony, Australia, and New Zealand.

THE Vulcan Motor Manufacturing and Engineering Company, Limited, of Bolton and Southport, have now fully equipped their new works at Haweside Street, Southport, and they expect to have on the road during the present month a new type of geared car, which will be placed on the market at a moderate price. Besides actually building cars, the Company also hold a large stock of accessories, oils, and petrols, and have garage accommodation for about 100 cars.

Glasgow to London Non-Stop Trial, 13th and 14th May, 1903.—The committee of the Scottish Automobile Club (Western Section) have arranged to have a motor cycle section in connection with the above trial. The entry fee is four guineas, and the last date for receiving entries is 1st May next. Other entries close on 13th inst. Copies of the conditions and entry forms may be had from the Hon. Secretary, Mr. R. J. Smith, 59, St. Vincent Street, Glasgow.

THERE will be seven neutralised portions in the Paris-Madrid Race.

THE Royal Automobile Club of Portugal are organising a fuel-consumption trial for next month.

MR. C. WHEELWRIGHT, of Birmingham, and Mr. J. A. Morgan, of Southsea, have been appointed official handicappers to the A.C.G.B.I. for motor cycle races.

THE weight of the "Napier" Gordon-Bennett racing car should be 16 cwt. 97 lbs., not 19 cwt. 97 lbs., as we were informed last week. The slip was a typographical error on the part of one of the maker's clerks.

A CONSUMPTION trial for motor bicycles was held in Vienna last week, over a course of 100 kilometres to Neustadt and back. There were fourteen starters, and thirteen completed the course. The winning machine was an Opel, with a fuel consumption of ·95 kilog.

As usual, several events are to be held this year under the auspices of the Namur and Luxembourg Automobile Club, starting on June 14th with the Sarthe (Huy) Hill Climb, followed by, on June 15th, a kilometre speed meeting, near Huy; on August 9th, a run from Namur to Arlon; and on September 7th, the Saint-Hubert Hill Climb of three kilometres.

AMONGST the runs during the season organised by the Manchester Automobile Club will be, on April 18th to Chester, 25th, to Alderley Edge, May 2nd, Leasowe (week-end), 16th, Tarporley, June 13th, Nantwich, 20th, Hill Climbing Competition, 27th, Llangollen (week-end).

THE North-Eastern Automobile Club, recently formed at Newcastle-on-Tyne, have elected the following gentlemen to form the committee:—Messrs. R. A. Young (chairman), W. Oliff, T. Sanderson, L. T. R. Ridley, F. Turvey, A. Scorer, R. B. Smith, R. B. Milburne, and R. Crosier. Mr. F. A. Young, of Jesmond, has been appointed hon. treasurer. Messrs. R. B. Smith and B. Walker will act as joint hon. treasurers, at 125, Glenthorn Road, Newcastle. The opening run to the Star Hotel, Alnwick, was appointed for Good Friday.

THE newly formed South Wales and Monmouthshire Automobile Club of Cardiff have decided to seek affiliation with the A.C.G.B.I. The Club will have their first run on Easter Monday, when the members will be the guests of Mr. Godfrey Clark, of Llantrisant. The route will follow a circular course *via* Pontypridd, Bridge End, and Cowbridge. To help popularise automobiles in the district, the Club are arranging for a number of decorated cars to take part in the parade at Cardiff in the summer in aid of the National Lifeboat Institution.

The inaugural meet of the recently formed Norfolk Automobile and Launch Club will be held at Great Yarmouth to-day (Saturday), when a Club parade from the harbour and back—about 4 miles—will commence the proceedings, followed by a luncheon at the Royal Assembly Rooms, at which the Mayor and Mayoress of Yarmouth, as well as the Mayor of Norwich, have promised to be present. By way of helping the meeting to success, the Victoria Mews has been placed at the disposal of the Club by Messrs. Howard and Thurtle, where all the participating cars can be stored free of charge.

As usual, the Yorkshire Automobile Club are holding an Easter tour. It commenced yesterday (Friday) with Bowness (Windermere) as the objective. The general meeting of the various sections of the Club was fixed at Skipton, and the route taken to Bowness was *via* Hellifield, Settle, Kirkby Lonsdale, and Kendal, a total distance of about 55 miles. Great care is enjoined by the secretary on the very steep hill between Settle and Kirkby Lonsdale. Otherwise the road—although towards Bowness it is rather hilly—is reported to be in fairly good condition. The head-quarters at Bowness are divided between the Crown and the Bellsfield Hotels.

It is not often that anything really worth having is given away for nothing; but we are asked to mention that about three or four acres of freehold land, situate within 80 miles of London, and at a spot where there is a good train service, is available, free of charge, for anyone who will erect and carry on a motor car works upon it. We are not in possession of any further information concerning this matter, but only draw the attention of manufacturers to it for what it may be worth. The offer seems to be suggestive of American methods, but *may* be very good business, for both parties, in spite (?) of that.

We learn that the chairman of the Kingston Bench, Mr. W. Y. Cockburn, has become an advocate of abolishing the speed limit. We are not quite sure whether we ought to say we are glad or not, because Mr. Cockburn states at the same time that he desires that Article 4 of the Local Government Board regulations shall still remain in force, and it may be that he is of opinion that as many motorists will be caught by that as by Section 4 of the Act. It is very probable, after the decision of the Divisional Court in Mayhew *versus* Sutton that this would be the case. However, perhaps, we ought to give the learned magistrate the benefit of the doubt.

Mr. Mark Mayhew has written to the daily papers that the Technical Educational Board might with advantage organise branches for training automobile drivers. Needless to say there are innumerable opportunities for intelligent young men as motor drivers. Existing drivers are frequently handicapped by want of knowledge and inadequate technical training. Mr. Mayhew's proposal, if carried out in practice, should have the result of providing, in course of time, a supply of drivers of a higher class.

The Metropolitan Asylums Board have now taken delivery of their first steam ambulance, which has been built by the Thornycroft Steam Wagon Company, Limited, of Chiswick and Basingstoke.

De Dion Bouton, Limited, have removed from Brook Street to more commodious premises at 10, Great Marlborough Street, Regent Street, which is within three minutes' walk of their old premises, and close to the Oxford Circus Tube Station.

Hitherto a service of omnibuses has been running regularly between Freshfield Station and Buckden in Upper Wharfedale, Leeds. This has now been discontinued by Mr. Harker, of the King's Head Inn, Kettlewell, who has passed on his interest to a company who intend working the district with motor omnibuses.

That the modern world is becoming less and less dependent on the railway is illustrated by the history of the railway strike at present in progress in Holland. The strikers have stopped the railway service between several towns, but all the available motor cars have been commandeered by the Government, and they are being employed to re-establish communication.

At the meeting of the New Amalgamated Tyre Company held last week, the Chairman, Mr. Ronald C. Power, stated that the new Velox car which was in course of construction would be ready for delivery in about three months' time. This new model is a cheap and popular voiturette and will have a 4-h.p. single-cylinder motor and a seating capacity for two persons. The selling price will probably be fixed at something over £100.

Last year the Huntingdonshire police obtained sixty eight convictions against automobilists for exceeding the speed limit. It is now announced that the standing committee of the county have decided to link all the police stations in the County by private telephone for the purpose of facilitating police business. No doubt this is chiefly levelled against motor cars being driven in excess of the legal speed limit.

Sir Evan James, K.C.I.E., C.S.I., has accepted the chairmanship of Clarkson, Limited, of Chelmsford. Sir Evan has had a very wide experience in organising and directing important departments under the Indian Government, including the Indian Post Office, acting as Commissioner in Sind. He has also been a member of the Viceroy's Legislative Council. His acceptance of this position should prove of immense value to the Clarkson Company.

A new use has been discovered for those ancient motor cars which though perhaps admired as novelties in the "heroic age" of automobilism, have by long use become too noisy for real enjoyment. They are invaluable for stopping runaway horses. An ancient vehicle of this kind was proceeding with much clatter of worn gear-wheels and knocking connecting-rods along Thornton Heath recently, when its occupants observed a runaway horse approaching and making a straight line for the car. The Thornton Heath horses have evidently become accustomed to up-to-date cars, for this one was so taken aback by the weird noises proceeding from the venerable car that was approaching him, that he came to a dead stop, and "while he stood considering the case," he was captured by his proprietor.

The attempt made on behalf of Mr. De Wilton to quash his conviction by the York magistrates on the ground of prejudice, bias, and improper conduct of one of the magistrates, came up for hearing at the Divisional Court before the Lord Chief Justice, Messrs. Justices Wills and Channel on Tuesday last, and was dismissed with costs. Mr. Wood, one of the York magistrates, had sat on the Bench beside the Chairman, got up in his place there, was sworn, and gave his evidence for the prosecution. When he had sat down again he had conferred with the Chairman and the other magistrates, who subsequently convicted the accused. The Lord Chief Justice of England holds that this is a proper proceeding in a magisterial court, in which opinion he is in flagrant contradiction to previous decisions of Divisional Courts. After this, and the case of the Worthing magistrates, it is quite obvious that there is no use in automobilists taking their cases to the Divisional Court. They may give up looking for consideration at the hands of Divisional Court Judges, at any rate until the progress of events and the natural operation of time places upon the Bench dispensers of justice more in sympathy with modern progress, and more respectful of the decisions of their predecessors.

Fifty thousand invitations are to be issued by the National Good Roads Association, supported by a large number of the leading associations in the United States and the St. Louis Automobile Club, to attend a convention to discuss the important subject of improving the American roads at next year's St. Louis World's Fair.

We have received from several prominent automobilists complaints as regards the fuel for explosion engines which appears recently to have found its way into the market. Both dealers and car users have for so long a time been accustomed to obtain a regular supply of "spirit" of low density that they have come to neglect examining what they receive. According to our correspondents, this unhesitating acceptance of anything sold as "motor-spirit" is likely to give rise to trouble, as samples have been encountered of a specific gravity as high as ·72 or even ·80. Of course, engines designed to utilise the lighter fuel will not work properly with oil of this class, and loss of power and eventual stoppage of action altogether is likely to ensue. If fuel of the class to which we refer is being introduced without notice to customers who have previously employed the lighter article, serious difficulties are likely to arise, and the industry to be seriously crippled if the practice is to continue. For the present we would advise all automobilists and agents to carefully test all consignments with the densimeter. We should be glad, too, if any of our readers who find that they have received consignments of heavier oil when expecting and being accustomed to receive the lighter fuel would apprise us of the fact. It will then be possible to obtain data as to the existence and extent of the evil.

(Photo by W. Lawrence, Dublin.)

The Gordon-Bennett Cup Race in Ireland.—The Curragh, looking towards Newbridge.

It appears that the new road from the Arc de Triomphe in Paris to the middle of the Forest of St. Germain is really to be constructed at last. The new road is to be 35 metres wide, bordered by two foot-paths of four metres in width. An electric railway is to run along the middle, and between it and the footpaths there will consequently be two roads of 7½ metres width. The total length of the road from Paris to St. Germain will be 18 kilometres. The cost is estimated at 1,160,000 francs.

The attempt to form a "Chauffeurs' Union" in New York having proved abortive, last month it was decided to organise the "American Chauffeurs' Club." There are many obstacles in the way of it being successfully carried through, and many are of opinion it will end in the same manner as the Union.

Arrangements are being made by the German railways to carry motor cycles as passenger luggage, and to forward them under the same conditions, and for the same charges, as other goods. Petrol tanks must be emptied before delivery of the machine, a fine of 12 marks per kilogram of weight being enforced for violation of this regulation.

Owing to the extent to which members of the Surrey County Council use motor cars and bicycles, to attend Surrey Quarter Sessions, the Standing Joint Committee, representing both bodies, at Kingston, on Tuesday, recommended the erection, near the County Hall, of a garage in which the cars and bicycles might be stored.

A Government Identification Bill for motor cars is coming nearer. On Tuesday night in the House replying to General Laurie and Mr. C. Wason, Mr. Long said he hoped to make proposals as to the general control of automotors, and to enable him to deal with their identification and the suppression of furious driving, legislation would be necessary.

M. M. Lebaudy's new dirigible balloon "Le Jaune" last week had a trial trip at Moisson, near Mantes, the spot where the airship is being constructed. It is reported to have remained in the air 25 minutes, and to have been several times guided round the course in the shape of a huge figure eight at an altitude of about 100 metres. A speed of about 13 kiloms. an hour was easily maintained, and M. M. Lebaudy and several experts who witnessed the trial are well satisfied with the results obtained. The motor employed is a Mercedes.

The Motor Manufacturing Company, Limited, send us their 1903 Catalogue, in which the various types manufactured by the Company are well illustrated. Particulars are given of the dimensions of the various standard chassis, and the measurements of the motors. In addition the Company have issued a booklet on the method of driving their car which should be found particularly useful to owners of these vehicles. The illustrations of the parts are from the original photographs prepared by ourselves in connection with an article which we published on the M.M.C. Company's system on October 11th last year.

LAW REPORTS.

Electric Motive Power Company (Limited).—On the 3rd inst., in the Chancery Division, Mr. Justice Farwell appointed a receiver of the property of this company, at the instance of the plaintiff, Mr. Roger W. Wallace, K.C., for whom Mr. Cozens-Hardy appeared, and who stated that Mr. Wallace held the two sole debentures issued by the company, one for £175 and the other for £416. Plaintiff's case was that it was one of jeopardy; various creditors were pressing, and execution being levied was apprehended. Counsel for the company said he could not resist the application, and his Lordship entered an ordinary debenture-holders' judgment.

Rear Lights on Motor Cars.—The driver of one of the motor cars used by Mr. J. A. Fyler, M.P., in the Chertsey election was summoned before the Woking magistrates on the 4th inst., for not showing a rear light. The Bench inspected the car, and found that, although lamps were carried on both sides, the red discs in the backs of them could not be seen from a point twenty yards behind the centre of the car. As the magistrates held that there had been no intentional evasion of the law they imposed a nominal fine of 5s. This practically amounts to a decision that a lamp in the back of an automotor is not necessary if the side lamp is so constructed and placed as to exhibit a red light backwards visible at a reasonable distance.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Coronet Motor Company (Limited).—Capital, £20,000 in £1 shares. Object, to acquire the business now carried on by W. J. Iden, at Foleshill, near Coventry, as the Carlton Motor Company. The firs directors are J. Perkins, J. Perkins, jun., W. Perkins, and W. J. Iden.

Oxborrow Brake Company (Limited).—Capital, £3,000 in £1 shares. Object, to acquire the business carried on at 57A, High Street, Clapham, S.W., as the Oxborrow Brake Company.

Ranelagh Motor Company (Limited), 6, Ranelagh Parade, Barnes.—Capital, £1,500 in £1 shares. The first directors are F. A. Monro and A. E. J. Steele.

Woolliscroft Motor Company (Limited), 177-179, Foleshill Road, Coventry.—Capital, £30,000 in £1 shares. The first directors are W. A. Taylor, W. W. Woolliscroft, L.R.C.P., M.R.C.S., and F. C. Colliard.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published April 9th, 1903.

6,428. M. E. P. Chaboche. Motor road vehicles.
6,559. R. Lang. Variable speed gear.
6,795. H. Chapman. Rotary fluid pressure and explosive engine.
7,000. T. D. Kelly. Explosive engines.
7,093. W. R. Cummins. Water tube boilers.
7,334. W. E. Rowlands and W. G. Hay. Motor road vehicles.
7,371. P. G. A. Peugeot. Steam generator.
8,921. F. Whitaker. Brake and steering mechanism and valve gear.
8,979. W. G. Wilson and others. Valves.
9,028. S. D. Begbie. Speed changing devices and means for controlling the "ignition," "mixing," and "throttle."
9,579. W. Horsfield. Rims for cycles and motor cars.
9,865. R. S. Lovelace. Electrical ignition devices.
9,943. W. Elliott and others. Variable speed mechanism.
11,284. E. Lenglez. Carburetting apparatus.
11,972. A. Fischer. Electric accumulator plates.
20,561. F. Anthione. Means for regulating speed and power.
24,416. E. G. C. Croxon and W. J. Ellis. Motor starters.
26,055. G. Ehrhardt. Motor cylinders.
26,688. C. Pinard. Coil clutches and brakes.
27,432. A. L. Barber. Ignition and lubrication apparatus.
28,183. H. H. Young. Speed reducing gear.
28,803. Soc. Mutel and Cie. Motor cars.

Published April 16th, 1903.

1,775. H. A. Bertheau. Explosion motors.
7,502. J. A. McMullen. Means of cooling pistons.
8,391. G. Lawrence. Radiators or condensers.
8,453. E. G. Brewer. Motor-driven bicycles.
8,539. J. R. Churchill. Motor vehicles.
9,026. L. R. Jones. Controlling of valves.
9,238. A. Craig. Transmission gear.
9,706 A. H. P. Blunt. Flying machine propeller.
10,143. J. Grouvelle and H. Arquembourg. Coolers or condensers.
10,422. L. A. J. M. Josseaume. Apparatus for carburetting air.
13,030. P. G. A. Peugeot. Automatic fuel feed regulator for flash boilers.
18,163. R. Pairer. Internal combustion engines.
28,791. Soc. Mont Pere et Fils. Explosion motors.

Applied for in 1903.

Published March 26th, 1903.

1,308. J. Willoughby and G. W. Bayley. Explosion engines.
2,195. W. Peto and J. W. T. Cadett. Electric accumulators

Published April 2nd, 1903.

1,516. A. Fouet. Circuit breakers.
1,598. F. Charron. Electric ignition apparatus.

Published April 9th, 1903.

1,122. E. Bergmann. Friction gear.
1,126. H. Attneave. Boot or shoe.
1,158. P. Pascaud. Carburettor.

Published April 16th, 1903.

3 75. A. J. McDonald. Steam generators.

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THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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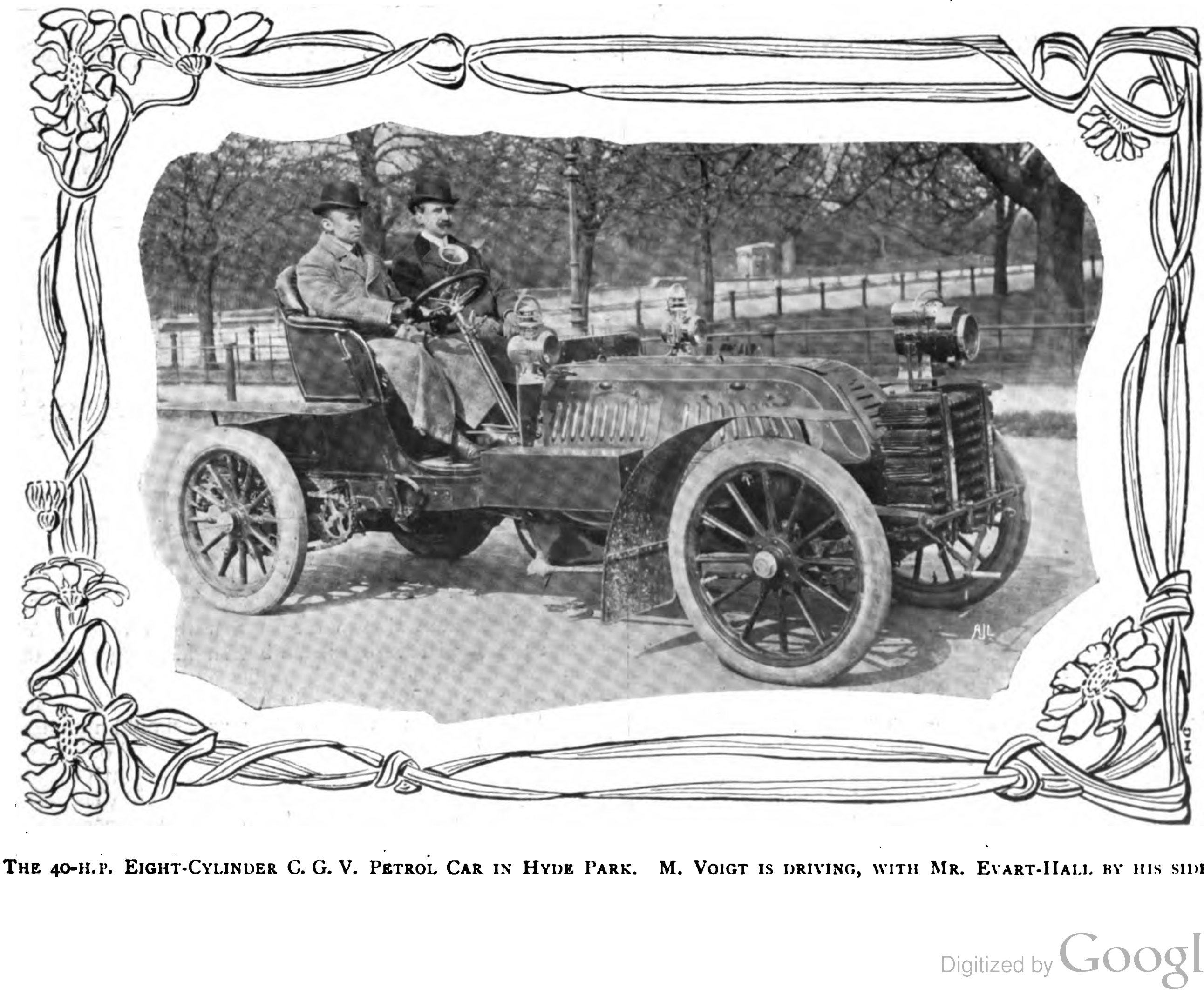

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DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
*April 24...		... Quarterly 100 Miles Trial.
April 25...		... Eliminating Trial Gordon-Bennett Race.
April 27, May 4, 11, 18		"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14		... Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
May 16 ...		... Sheffield A.C. Hill Climb, Padley Wood.
May 23 ...		... Scottish Auto Club Hill Climb.
*June 13 ...		... Gymkhana at Ranelagh.
June 20 ...		... Manchester Auto Club Hill Climb.
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park.
July 6 ..		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy.
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork. Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
July 24-25		... Southport Speed Trials.
*August ...		... Tourist Motor Bicycle Reliability Trial.
*September		... The 1,000 Miles Trial.
1904.		
		... *Light Van Trials.
*Feb. 12-24		... Crystal Palace Exhibition.

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
April 16-20	... A. C. de Touraine Tourist and other Trials.
May 9-14	... Belgian National "Circuit."
May 14 ...	... Paris-Madrid. Start of Tourist Section.
May 16-24	... Stockholm Exhibition.
May 18 ...	... Speed kilom.—Geneva (Swiss A. C.).
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May 25-30	... Hanover Alcohol Van Trials (German Agricultural Society).
May or June	... Austrian "Circuit."
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-28	... Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18 ...	... Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21	... Circuit des Ardennes.
June 28 ...	... Laffrey Hill Climb.
July 5 ...	... Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 19 ...	... Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16	... Race Trelex-Saint-Cergves (Swiss A. C.).
September	... Udine Exhibition (Italy).
Oct. 15-21	... Leipzig Exhibition.
Nov. 15 ...	... German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

THE "CAR," THE "CLUB JOURNAL," AND OURSELVES.

LAST week we were able to record that the protest which we made in our issue of the 28th March, in regard to the policy of the Automobile Club and its *Journal*, had resulted in the Club Committee recognising the justice of our complaint and deciding that the *Club Journal* should no longer be conducted in the manner to which we raised objection. We are now glad to be able to add that our artistic contemporary, the *Car*, has ably and straightforwardly endorsed our view of the situation and has cordially supported the line which we adopted. In an editorial last week the Hon.

John Scott Montagu alludes to "the timely and justifiable protest of The Automotor Journal," and adds, "The Automotor Journal and its Editor, having always been strong supporters of the Club, and having done everything to help its best interests, the reproof could not have come from cleaner or better hands." We heartily recognise the value of the *Car's* support in any question of this kind, and we would add that its right to adopt a similar attitude to that which we have taken up is at least as unquestionable as our own, for Mr. Scott Montagu has always strongly upheld the best interests of the Club, and has, therefore, a very special right to criticise if he feels inclined. We expected nothing less of our contemporary, for its conduct has always been free and independent; but we must say that we have experienced a certain amount of surprise that the *Car* is the only other automobile paper which has given expression to similar views. The whole automobile press was concerned by the imputations to which we felt bound to take exception. There are occasions when not to resent an imputation approaches very closely to acknowledging its justice.

COUNT ZBOROWSKI.

April 1st, 1903.

One moment calm, alert, serene,
  With eagle glance and nerves of steel,
Each sense to dare and conquer keen,
  A gallant form he grasped the wheel!
Then, as the signal bade him "go,"
Sped like an arrow from the bow.

A swerve, a jar, a deafening crash,
  Then ruin swift, complete and dread
As leaves at times the lightning flash!
  And he, who oft before had led
The rushing whirlwind of the race,
No more would know the leader's place!

No more! But never manlier fate
  Met soldier on the foughten field,
A foremost fighter in the great
  Strife men with Nature's forces wield.
Bold, over-bold may be, but still
We love that headstrong, fearless will!

A STRANGE SOURCE OF ENERGY.

Every source of energy, and particularly heat energy, is a matter of interest to all who are engaged in its application to practical purposes. Among these automobilists take a high place. There is no more practical application of energy than its adaptation to locomotion, or a more fascinating one than its employment for the production of high speeds. It inspires everyone, even Mr. Henley, though he does not like the appearance of the modern motor car. As large and enthusiastic utilisers of energy, automobilists, therefore, cannot fail to be interested in the extraordinary phenomena presented by radium. It is a perpetual source of energy which it procures apparently from nowhere, that is to say, the source of the energy is at present unknown. It gives off into space not only a continuous stream of "radium rays" and Röntgen rays, but it also develops a very considerable amount of heat. Prof. Curie and M. Laborde have been making careful estimates of the amount. It would be outside the scope of this journal to deal in detail with the experimental methods adopted; it is sufficient to say that the result shows that 225 grms. of radium develops about as much heat per hour as would be produced by the combustion of 1 grm. of hydrogen in oxygen. Worked out in practical figures this means that a gramme of radium disengages as much heat as converted into mechanical energy would be capable of performing an appreciable amount of work. This is a very remarkable result, because the radium does not waste away or lose weight in the process, at any rate to such an extent as can be measured by our instruments. Here is something to all intents and purposes burning and nothing is burnt. If boilers could but be heated with it! But, alas, it is one of the most expensive substances in existence. Still, this is the first occasion on which Nature has ever been discovered giving something for nothing—for nothing that costs us anything—and the mere existence of such a phenomenon has something of promise and hope for the future.

Messrs. Curie and Laborde seem to think that the radium utilises some unknown source of energy. Sir William Crookes rather favours the view that the substance exercises a selective effect on the air particles by which it is surrounded, taking energy from the rapidly moving molecules, while exercising but little action on those that are travelling slowly—behaving, in fact, like the celebrated imaginary "demons" of Clerk Maxwell. Whatever the explanation of its action may be, however, it seems to be already exercising a heating effect on the brains of "crank" inventors. This was to be expected, and generally happens with new discoveries. One that seems to promise a supply of energy for nothing is particularly certain to set off the perpetual-motionists in full cry. One of them is already at it in America. He has a wheel with "hollow rim drop-magnets" and a round iron ball, with last, but not least, a *small* quantity of radium. This wheel will go on revolving, in fact nothing can stop it, and therefore if applied to a suitable propeller would drive an airship at 100 miles an hour, or faster. Why not? This the inventor thinks will enable him to reach the moon. May he remain there!

As we go to press comes the announcement that a Russian engineer (Russian engineers often do wonderful things) has discovered in Central Asia (where these things usually are discovered) "a deposit of native radium." Happy the man on whose property it exists. Perhaps Mr. Hooley will purchase a concession from him. We have more than our doubts, however, about this native radium, though we expect to hear at an early date that Samoyede peasants or the like have for a long time past utilised its heating properties, and are at present engaged in frying their bacon (if any) on it.

SUPERSTITIONS AND MOTORS.

We gather from a daily contemporary that motor-car drivers, progressive as they are in most matters, still preserve remnants of primeval superstitions. There are times no doubt when many a motor man is inclined to the belief that his motor "hath a devil," but that, if it can be called superstition, is about the only recognition of the unaccountable which we have observed in motorists as a class. However, our contemporary informs us that in many cars is suspended a sea-rolled flint with a natural hole in it, supposed to act as an amulet. The hole must be natural and then it is supposed to protect you against collisions and all other accidents. Of course if a man firmly believes in a talisman of any kind it may give him nerve, and many accidents occur from want of nerve. But we should like to see a car with one of these stones. Above all do they protect from the police, and would a car carrying one of them be more than usually likely to pass unscathed through a police trap? The continuance of superstition, or perhaps we should say its growth, seemed to derive some colour from the story told in connection with the unfortunate Count Zborowski. He is said to have consulted or been frightened just before the race by a palmist and an astrologer. We doubt that he was the kind of man to have consulted either. But there is no doubt that in the fashionable world of to-day, to which motorists so largely belong, both these classes of practitioners do a large business. They ought, we think, to be prevented from frightening people—particularly drivers on the eve of a race. There are classes of predictions that are only too likely to contribute to their own fulfilment.

AN AMERICAN CONTEMPORARY ON THE GORDON-BENNETT RACE.

It is of interest to find that an American contemporary very fully recognises the added importance which accrues to the Gordon-Bennett race in virtue of its being held in this country, and thereby constituting an entirely independent event. Hitherto it has been practically a mere appendage to one of the great Continental races. Now it will stand alone. Says the *Motor World*:—

> "This year, for the first time, the Bennett Cup Race will be an event of the first magnitude; one thoroughly in keeping with the conceptions of the donor of the Cup. Prior to the 1902 race the event was of secondary importance. Even last year it was dwarfed by comparison with the Paris-Vienna contest, being run in conjunction with it, and being provocative of interest chiefly because the Cup was, for the first time, wrested from the French club which had held it from the beginning.
>
> "The 1903 race marks a new era. The race is to be run alone, over a course especially selected and used only for this race. The contestants, officials, and visiting spectators will go to Ireland to see this race, and at its conclusion will disperse, their labour or pleasure at an end. And for the first time also the competing teams will be representative and 'classy.' France, Germany, and the United States will all send teams to wrest from Great Britain the trophy emblematic of speed supremacy on the road which the latter will then have held for a year. The cars will embody the latest and most approved principles of construction, power and speed being the prime considerations; and the men who will drive them are the recognised giants of the automobile racing world. It will be a veritable battle of Titans, one well worth going a long way to see."

THE AUTOMOBILE AND SPORT.

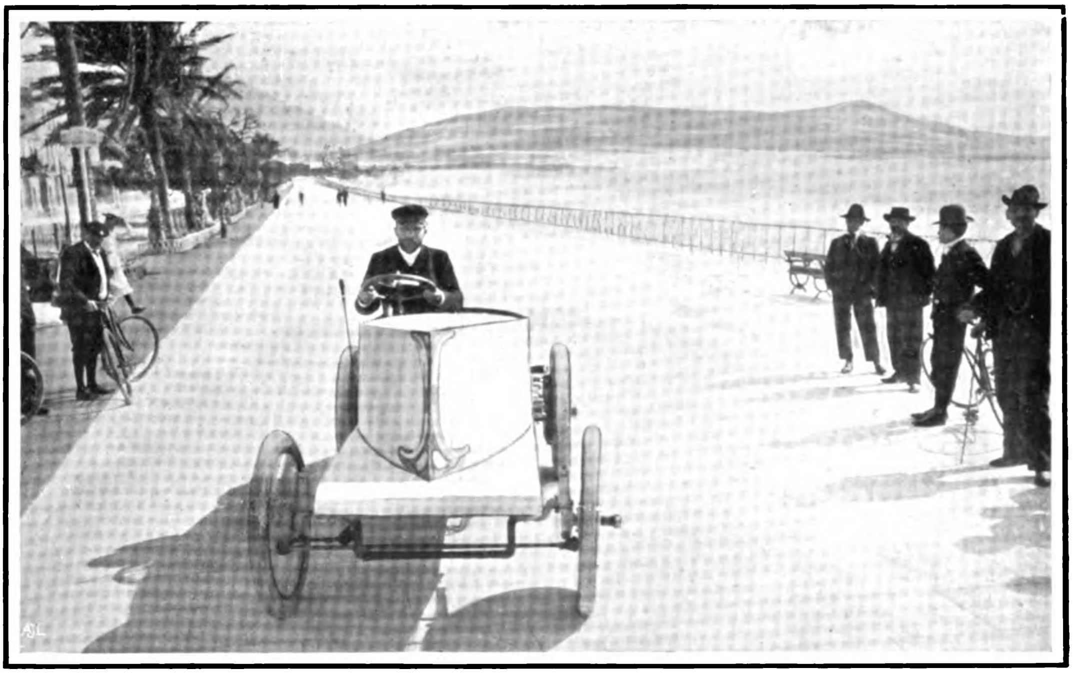
The *Car* for last week contains a very sensible and well-considered article on the automobile in relation to sport, which will doubtless do a great deal to remove any prejudice which may still prevail against its use in hunting circles. Our contemporary points out that particularly for Masters of Hounds, who have to attend meets regularly and often at very great distances, the car is an unspeakable blessing. Its services in connection with fishing and shooting are of almost equal value, and, in fact, in every way the new locomotion is rapidly becoming the sportsman's most powerful friend. There is one service, however, to which, as far as we know at present, it does not appear as yet to have been adapted, and in which it ought to find a very useful sphere. Masters of hounds frequently are obliged to transport their own and huntsmen's and whip's horses long distances. For this the railway is often utilized, though it rarely can be employed for more than a portion of the route. Even when it is, horse-boxes have to be arranged for beforehand at considerable cost, and the whole business is troublesome in the extreme. Why should not motor-horse-boxes be designed and the horses conveyed direct to the meet in them whenever it is at a sufficient distance? This would save the mounts enormously, for, even when led, a twenty-mile trot before a meet takes a good deal off the freshness of the best hunter. A stud of motor-horse-boxes would be a valuable adjunct to every hunt and, besides saving the horses, would make them accustomed and ultimately even friendly to the motor.

STEAM RAILWAY MOTOR CARS.

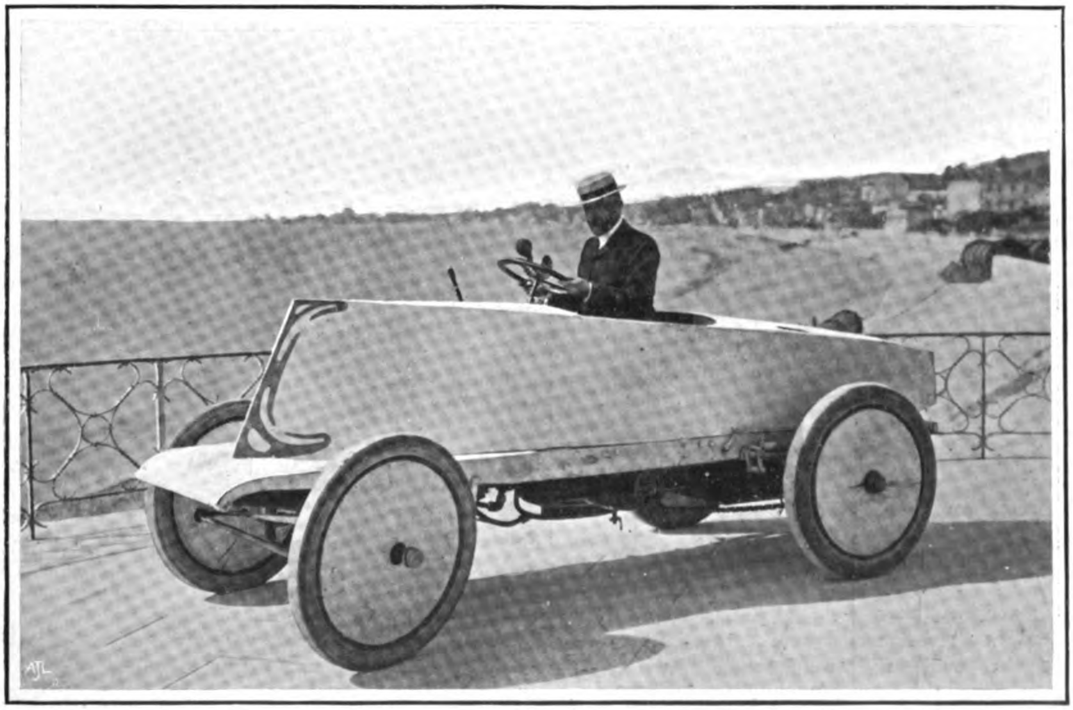
The question of equipping independent railway carriages with their own motive power has recently received a considerable amount of attention from several of the large railway companies in this country. Such self-propelled coaches are, of course, chiefly required for the small branch lines, where the passenger traffic is insufficient to warrant the employment of large locomotives and long trains. Even on the main lines, however, and particularly for the suburban traffic, there are times during the day when a considerable amount of economy could be effected by their use. The idea is not a new one, for at least one such coach has been used in France in connection with the post office for some little time. We have already drawn attention to the fact that the North Eastern Railway Company are experimenting with petrol motors for this purpose and that it is intended to employ an electric system for transmitting the power to the driving wheels. These experiments have not yet been completed, and therefore the honour of having projected the first carriage of this kind in actual service in England falls to Mr. D. Drummond, M.I.C.E., who has designed and constructed a steam-driven car which is to run between Fratton and Havant as the joint property of the London and South Western and the London, Brighton and South Coast Railway Companies.

The new carriage, with its steam equipment, may be regarded almost as a cross between a modern bogie railway coach and a steam tram-car. It is, therefore, of considerably less interest to our readers than any petrol-electric carriage would be. But its performance, and that of the sister vehicle which is to work over the same route, will doubtless do much to further the introduction of such rolling stock. The body provides accommodation for 42 passengers, and has a luggage van attached to it. The boiler, which has vertical and cross tubes, is of the vertical type, and is placed in front of the driver's cab. The engine has a pair of high-pressure cylinders, with a bore of 7 inches and a stroke of 10 inches. The engine drives direct on to one of the axles of the front bogie, and the four wheels of that bogie are coupled together. The coach is intended to be driven from the front end in ordinary practice, but provision is made at the rear by which the engine and the brakes can be controlled from that end if required. It is probable that the pioneer work of steam-lurry manufacturers in this country has done more than a little towards enabling a vehicle of this class to be successfully constructed with a minimum of previous experiment. Automobilists will have much to be thankful for if the development of schemes of this nature should tend to prevent the further encumbering of the public roads by their worst enemy, the tram-car.

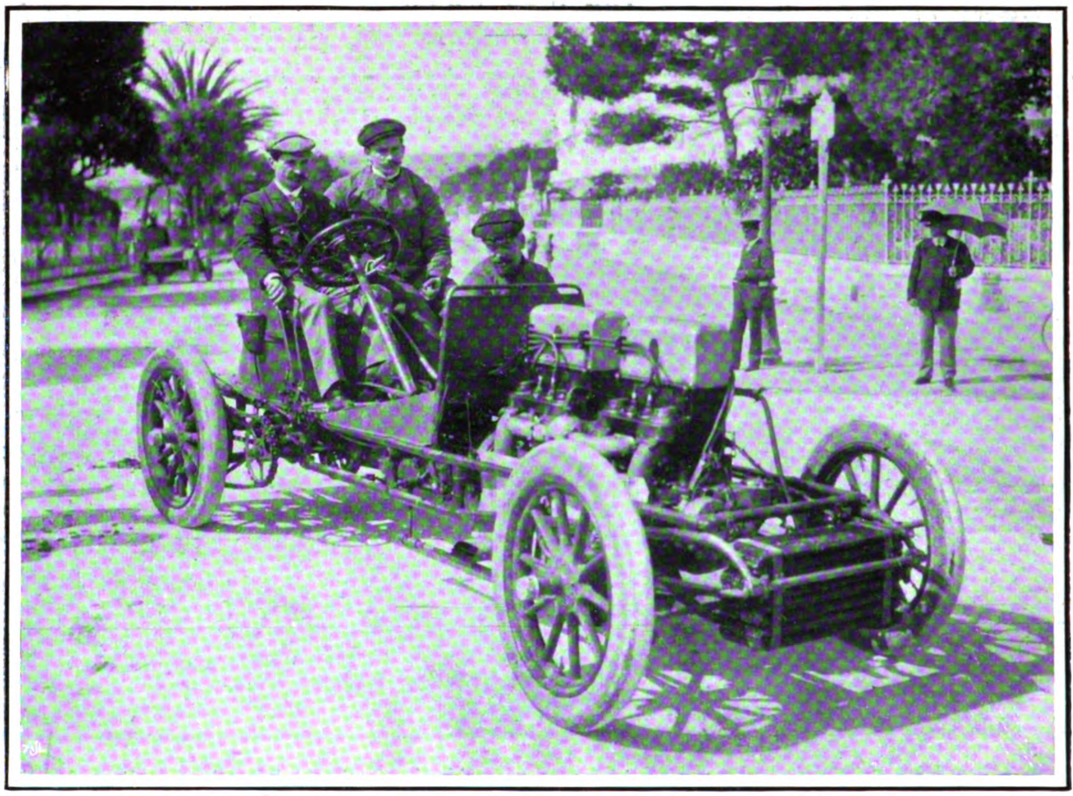
THE NICE WEEK.



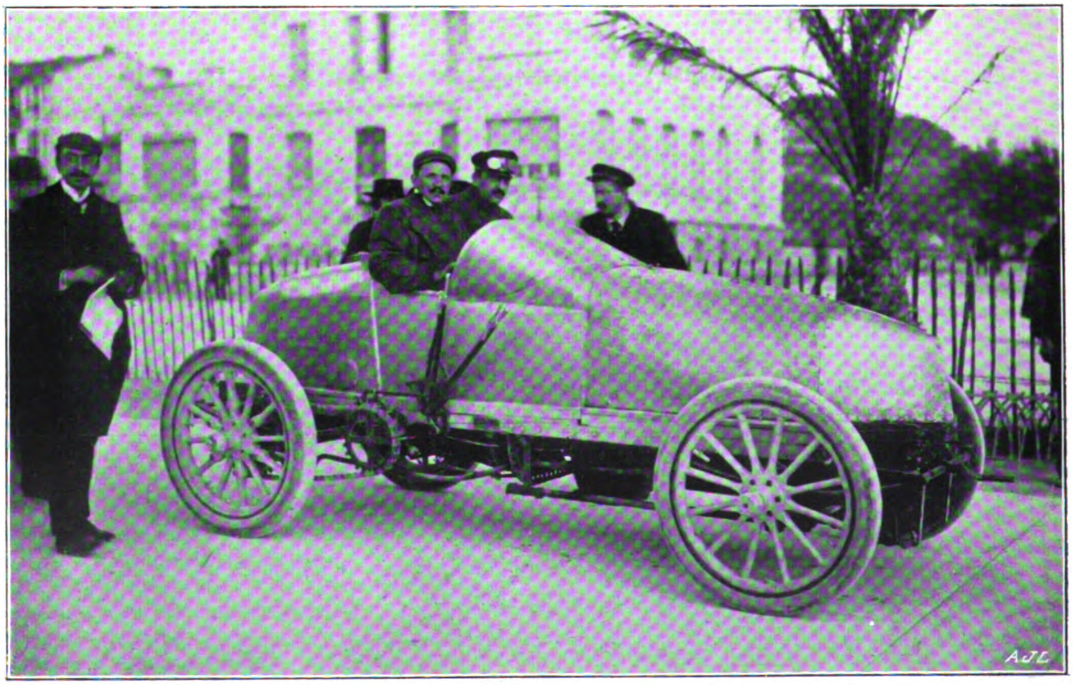
The Nice Week.—Front View of M. Serpollet's new Racing Steamer, with which he, for the third time, won the Baron Henri de Rothschild Cup for the Flying Kilometre.—Time, 29·19 seconds = 123·28 kiloms. or 76·60 miles per hour.



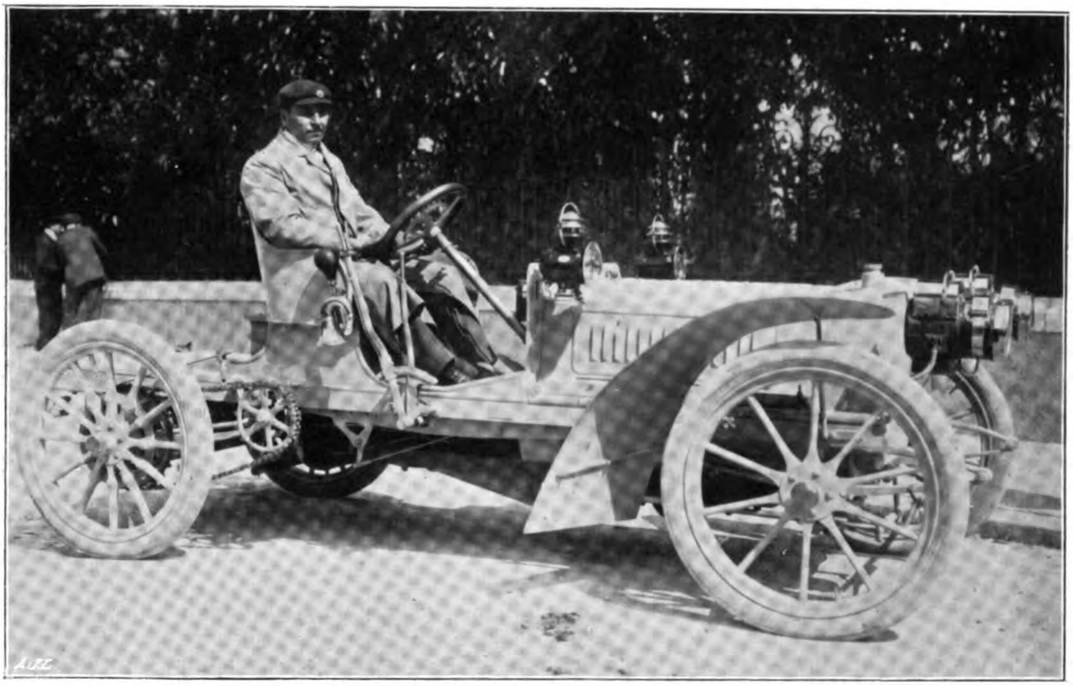
Side View of M. Serpollet's Racer.



The Nice Week.—One of the 120-h.p. Gobron-Brillié Racers—Paris-Madrid Type—on the Promenade des Anglais, driven by Rigolly.



The Nice Week.—Gabriel on a 60-h.p. Mors Racer.

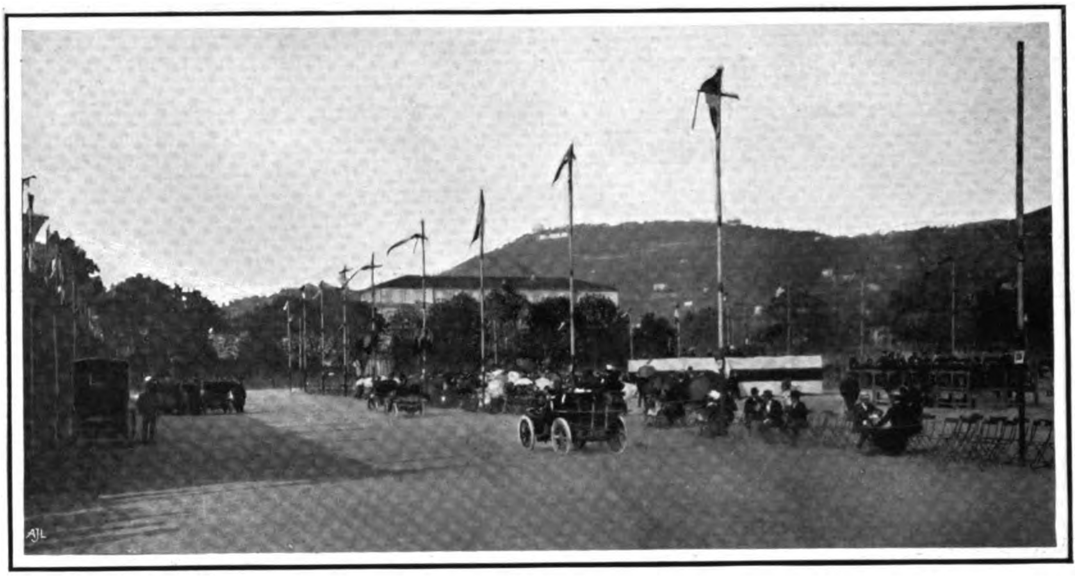


The Nice Week.—One of the 1903 Rochet-Schneider Cars.

Last week we gave all the times for the mile (standing start), Mr. Alfred Harmsworth's 60-h.p. Mercedes, driven by Braun, topping the string of record breakers with 1 min. 3·72 secs., Baras in the Light Car class, on a Darracq, being also ahead of Augières' previous record of 1 min. 9 secs. by nearly one second. We also gave the times for the Rothschild Cup, No. 1 (flying kilometre), this trophy being secured for all time by M. Serpollet, whose win was the third time in succession. At no time, it is stated, did M. Serpollet let his car feel its full power, and he is credited with having solemnly declared his intention—in consequence of Count Zborowski's mishap—of abandoning further attempts at high speeds.

We give this week several more interesting photographs of cars and scenes taken during the Nice week.

The Nice Week.—Rigal on a 60-h.p. Mors, in the Standing Speed Mile.—Time, 1 min. 5·32 secs.



The Nice Week.—The "Procession" round the Place d'Armes of the Competing Cars in the Fuel Consumption Trial.

We now give the times over the flying kilometre for the second Rothschild Cup, which was only open for competition to vehicles with internal combustion engines :—

Rothschild Cup No. II.

		sec.
1.	Hieronymus (Mercedes)	31·76
2.	Werner (Mercedes)	31·90
3.	Braun (Mercedes)	32·73
4.	Degrais (Mercedes)	32·89
5.	Rigal (Mors)	33·2
6.	De Caters (Mors)	34·81
7.	Augières (Mors)	1 15·60

The times for the "flying" kilometre, taken during the standing mile race, the results of which we gave last week, were as follows :—

		secs.
1.	Le Blon (20-h.p. Serpollet)	31·53
2.	Braun (60-h.p. Mercedes)	32·8
3.	Werner (60-h.p. Mercedes)	32·9
4.	De Grais (60-h.p. Mercedes)	33·9
5.	Augières (60-h.p. Mors)	33·24
6.	Rigal (60-h.p. Mors)	33·53
7.	De la Ferté-Meun (40-h.p. Mors)	33·58
8.	Gabriel (60-h.p. Mors)	35·6
9.	Hieronymus (60-h.p. Mors)	35·6
10.	Baras (45-h.p. Darracq)	35·21
11.	Gentil (4-h.p. motor cycle)	36·65
12.	Demester (ditto ditto)	56·40

After the specified programme of events had been completed, several unsuccessful attempts were made to lower the flying kilometre time, the nearest to succeed being Braun on the Mercedes in 30·79 secs.

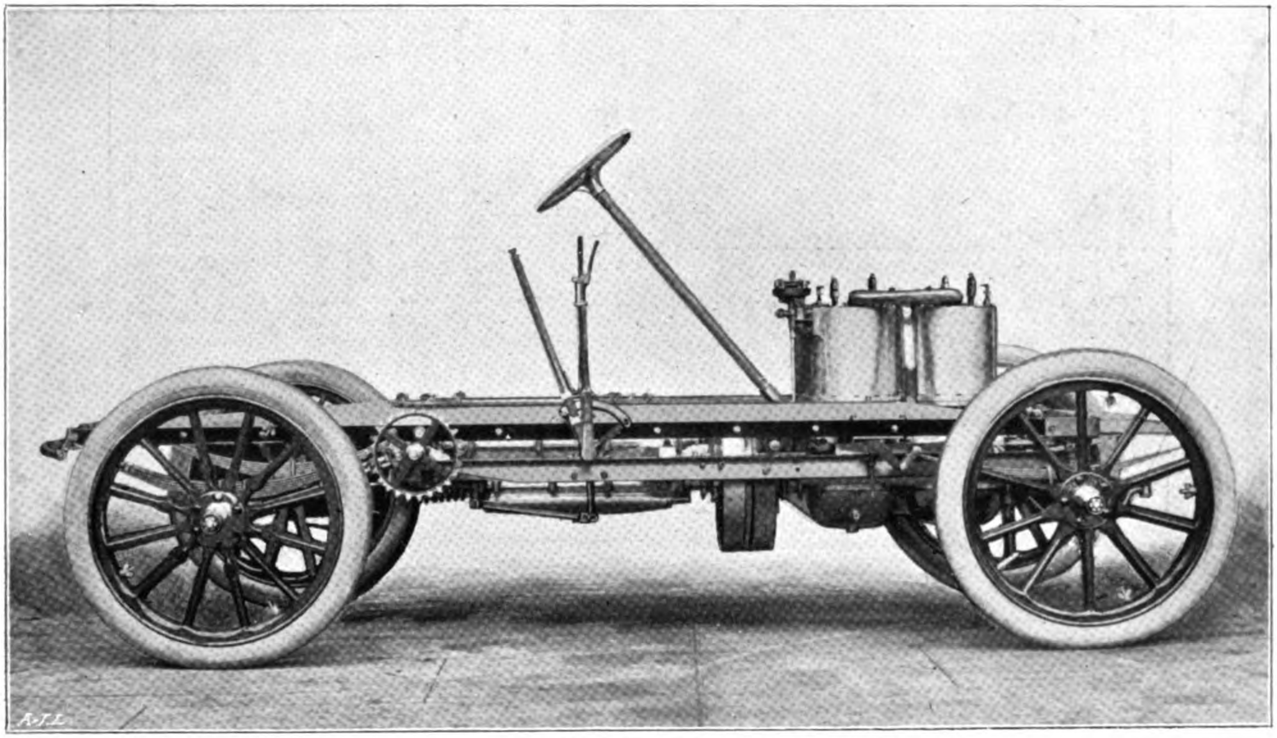
With due solemnity the remains of Count Zborowski were laid to rest on the 9th inst. at Burton Lazars, in his family grave. The coffin-plate bore the inscription: "Count Elliott Zborowski. Aged 45 years. Died at Nice April 1, 1903." Besides Countess Zborowski, a large number of mourners assembled to pay a last tribute to the deceased, the Automobile Club being officially represented. Amongst the wreaths sent were emblems from the members of the local Hunt, the Automobile Clubs of Great Britain and Ireland, France, Germany, and Nice.

THE DIETRICH-BUGATTI PETROL CARS.

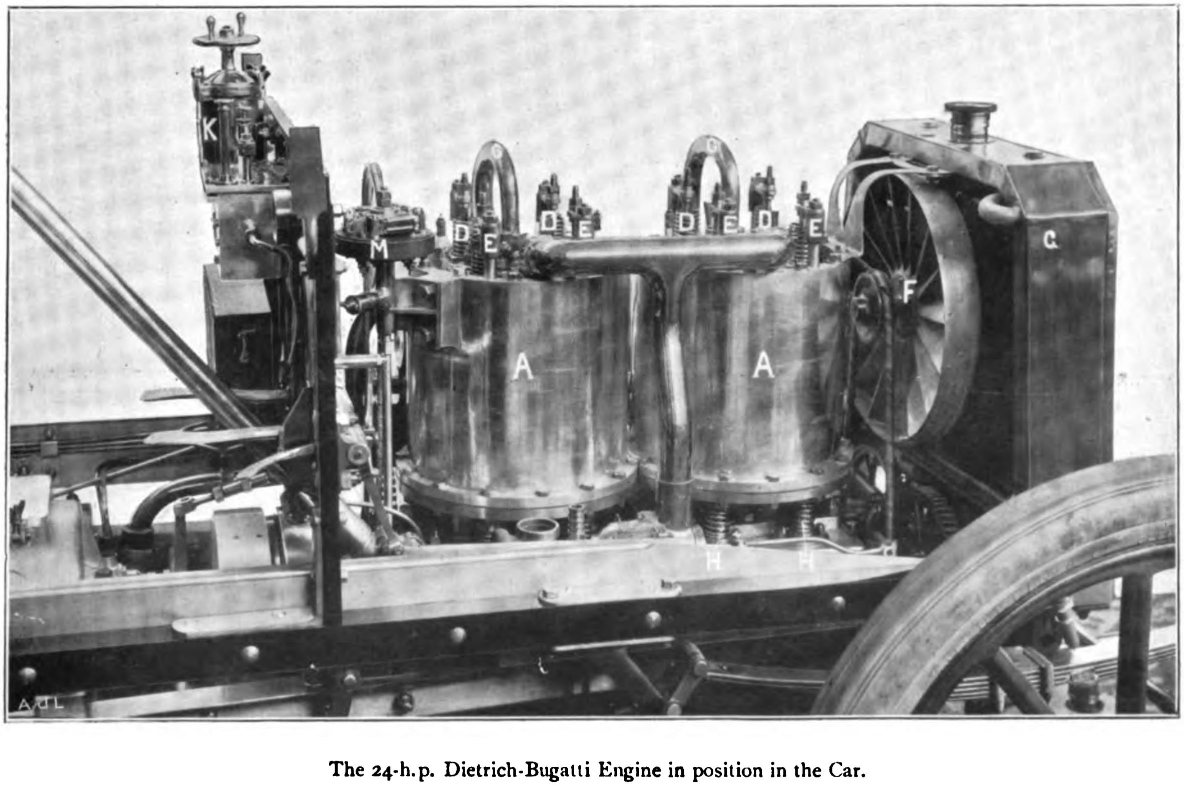
The accompanying illustrations represent a partly-finished 24-h.p. chassis and the engine in position on the chassis respectively. We also reproduce a side elevation and plan of the car. This new vehicle, which has been designed by Herr Bugatti and constructed by the German Dietrich firm at Niederbronn, is chiefly noticeable owing to the peculiar construction of the engine.

Each pair of cylinders is cast in one piece, but without any water jacket, and each of these castings is then enclosed in a circular aluminium casing, A, which forms the jacket round them; the inlet valves, E, the exhaust valves, D, and the ignition plugs are all fitted in the heads of the cylinders. The valves are all mechanically operated, and a cam-shaft lies along each side of the crank-chamber for operating them. The rods, which are seen passing through the castings, A, serve to transmit the motion of the cams to the valves, and the springs, H, are fitted beneath the casting in order to support the weight of the rods. The engines are not only fitted with high-tension ignition plugs, for which the bevel-geared commutator, M, is required, but we understand that magneto ignition is also fitted, although we can find no trace of it in the photographs which we have received.

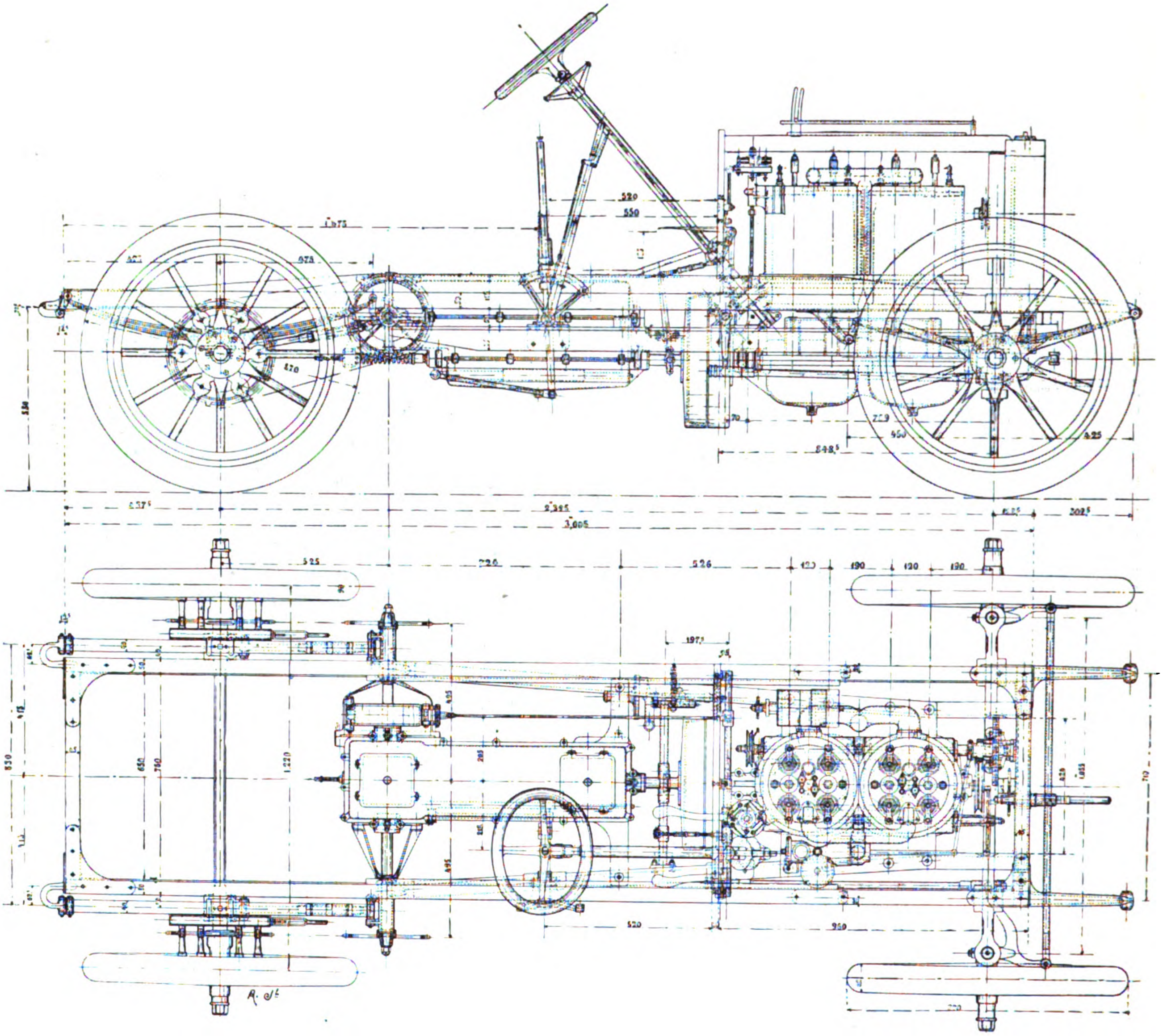
The main frame is built of stamped steel, lined with wood, and the engine and gear-box are carried on an underframe. Side chains are used for driving the rear wheels, but the large sprockets were not fitted at the time that the photograph, which we reproduce, was taken. The change-speed-gear, which is operated by a single lever, gives four forward speeds and a "reverse." The speed of the engine is regulated by an automatic governor acting on the throttle-valve in the usual way. The cylinders have a bore of 114 mm. and the stroke is 130 mm. The range of speed is from 250 to 1,400 revs. per minute. The car is fitted with a honeycomb radiator, G, behind which is mounted the belt-driven fan, F. The water pipes, C, leading from the tops of the jackets are seen in our illustrations, and we understand that a certain length of the exhaust passages leading from the cylinders are



Side View of the Dietrich-Bugatti Chassis.



The 24-h.p. Dietrich-Bugatti Engine in position in the Car.



Side Elevation and Plan of 24-h.p. Dietrich-Bugatti Chassis.

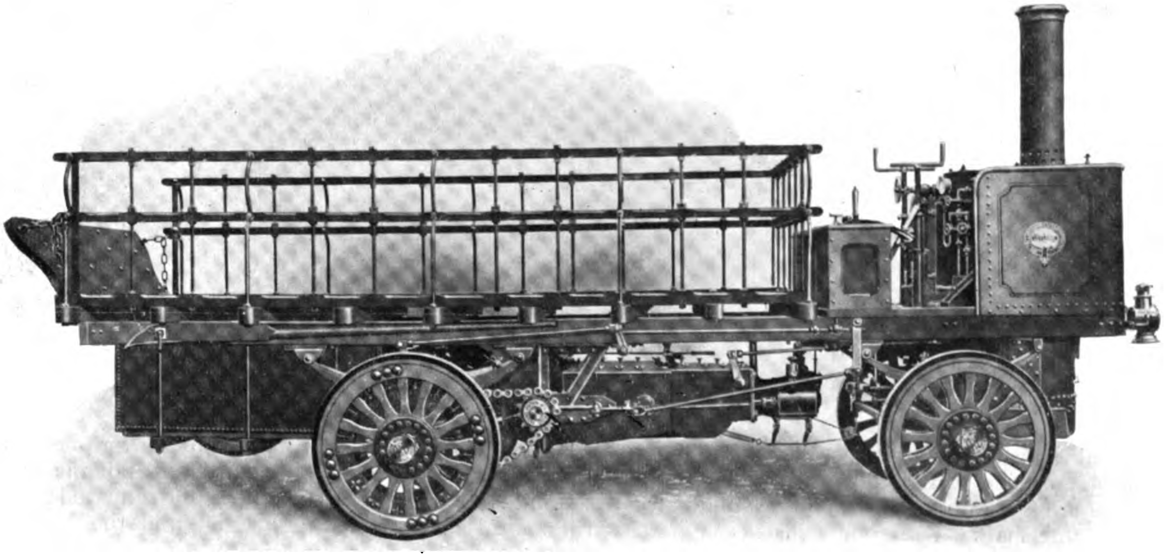
taken through the water jacket in order to assist in silencing them. The exhaust pipes, however, are on the opposite side to that shown in our illustration of the engine, and we cannot, therefore, speak with any certainty concerning their arrangement, although we must confess that it seems inconceivable at first sight that the radiator—which is an expensive apparatus to manufacture—should be increased in size in order that the size of the exhaust box—which is not anything like so expensive to build—may be reduced; from the point of view of weight, also, it would appear to be an ill-advised arrangement.

The Company are now building a 50-h.p. racing car, which is intended to take part in the Paris-Madrid race. The frame of this machine is being made of tubes of unusually large diameter, which are being used for carrying the cooling water. The wheel base is said to be about 9 feet 10 inches, and the track about 4 feet.

As we foreshadowed about three weeks ago, the threatened Selden litigation in the U.S.A. has been practically arranged. The Association of Licensed Automobile Manufacturers has been formed, consisting of about twenty of the leading makers of the United States, who have entered into a nine years' agreement to recognise the validity of the patent, pay licence fees, and to pool their interests in order to compel all others to do the same or to fight the matter out in the courts. Naturally the leading part in this arrangement has been taken by the Electric Vehicle Company, of Hartford, who acquired the rights under the original patent, and amongst those who have joined the Association are the following companies:—Winton, Olds, Packard, Peerless, Haynes-Apperson, Apperson Brothers, Searchmont, Locomobile, Geo. N. Pierce, Knox, Long Distance, Pan-American, International, Pope-Robinson, Waltham, Stevens Arms, and H. H. Franklin.

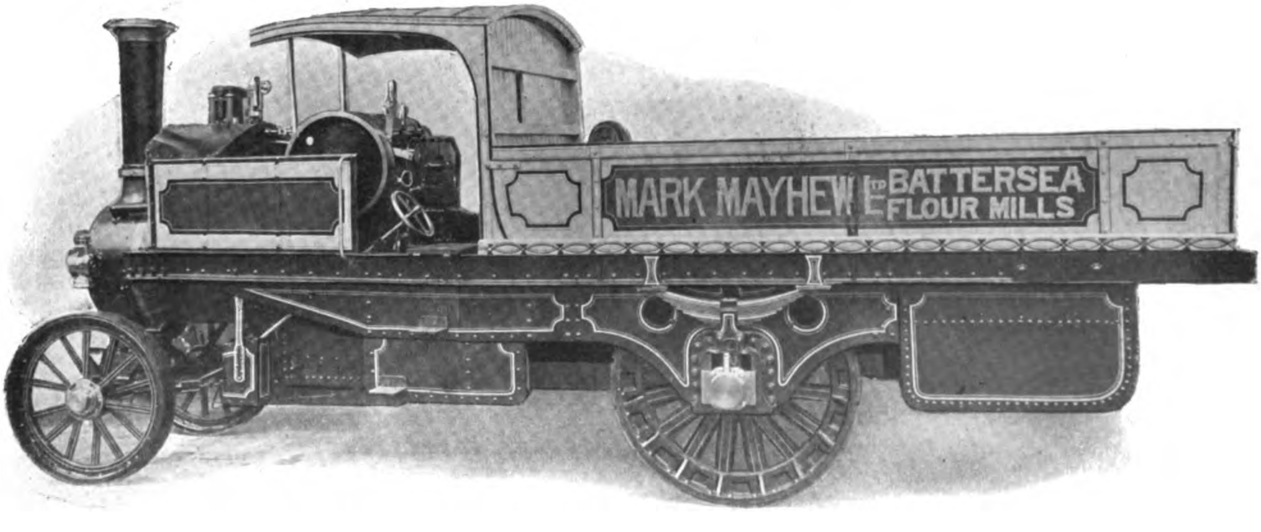
THE ANNUAL AGRICULTURAL HALL EXHIBITION.—PART IV.

As we have already said, there was an unusually good show of steam lurries on this occasion, although one or two well-known makers were not in evidence. Of those exhibitors whose vehicles we have fully described in the past, mention should be made of the Lancashire Steam Wagon Company, the Yorkshire Steam Wagon Company, Coulthard and Co., and the Straker Steam Wagon Company, besides Fodens, Limited, and Mann's Steam Car and Wagon Company, with their miniature traction engine form of construction. Other makers who, so far as we are aware, have not hitherto shown vehicles of this kind were E. S. Hindley and Sons, Savage Brothers, and Wallis and Stevens, besides W. Tasker and Sons, with their diminutive traction engine. The older makers do not appear to have made any radical alterations in their standard vehicles recently, although many minor improvements are to be noticed by those who have made a special study of this branch of the industry. Their lurries are now so thoroughly satisfactory in practice that they can devote their whole energies to cheapening the cost of manufacture, and to turning out the machines in sufficiently large quantities to meet the ever-growing demand.

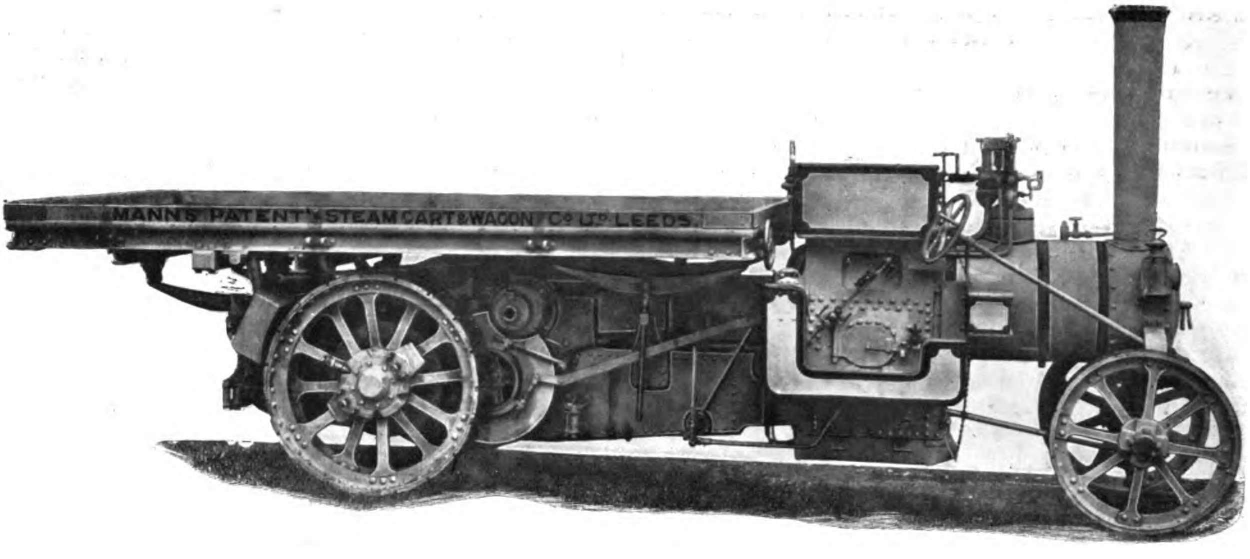


The Lancashire Steam Wagon Company's Lurry.

In the Hindley lurry, an unusual method is adopted for transmitting the power from the engine to the road wheels, and for yet allowing the frame to move in the necessary manner relatively to the rear axle. In this machine the engine is of the double-acting compound type, the cylinders lying horizontally, and the moving parts being all enclosed in the crank-chamber. The engine lies to the left side of



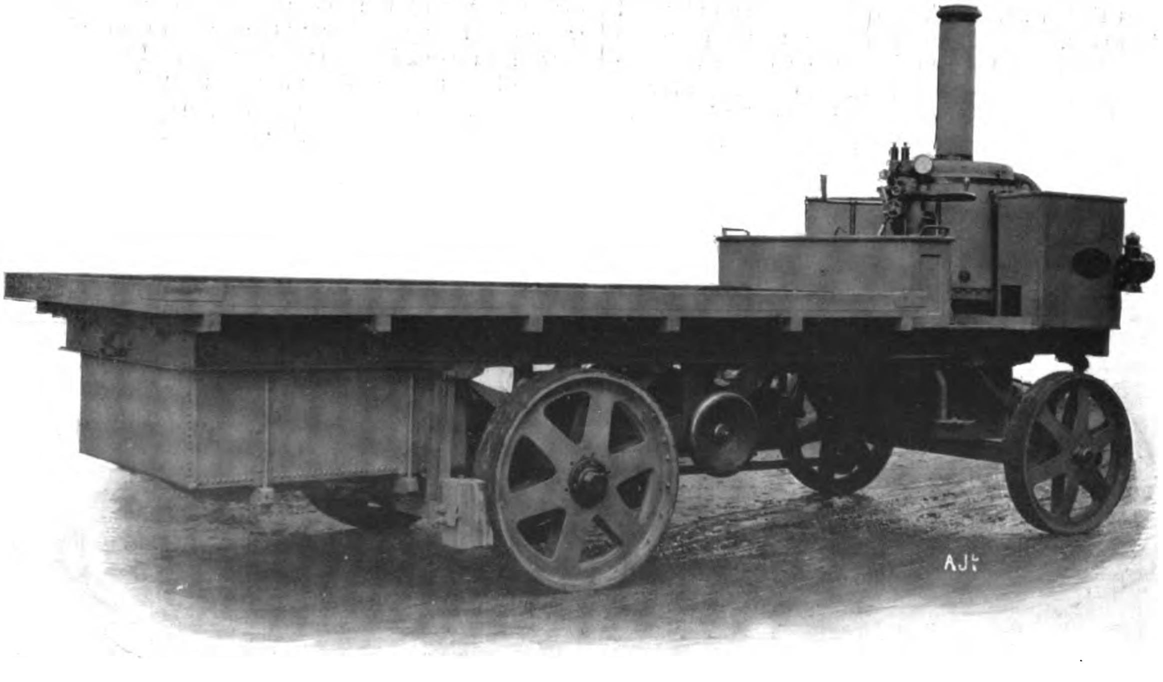
A Foden Steam Lurry.



The Mann Steam Lurry.

the frame, and the crank-shaft projects across to the right-hand side. It carries two sliding spur-wheels, either of which can be brought into mesh with corresponding wheels on a short countershaft. The countershaft is supported in bearings in a special frame, which is hung so as to act as a radius rod between the crank-shaft and the rear axle. A central spur-wheel on the countershaft is at all times in mesh with a larger wheel, which is fixed to the shell of the differential gear on the live-rear-axle. This gearing does not occupy much space, and is placed just inside the main frame on the right. The usual provision is made for admitting high-pressure steam to the low-pressure cylinder when desired. The boiler employed is of the vertical type, and is arranged centrally above the front axle. The usual controls are provided throughout, and the lurry has a very business-like appearance.

In the Savage "Universal Carrier" the power is transmitted from a transverse countershaft, having the differential gear on it, to the driving wheels by means of side chains of the block type. The chain wheels are fixed to the driving wheels by means of steel brackets, which contain spiral springs giving a cushion drive. The engine is a



The Hindley Steam Lurry.

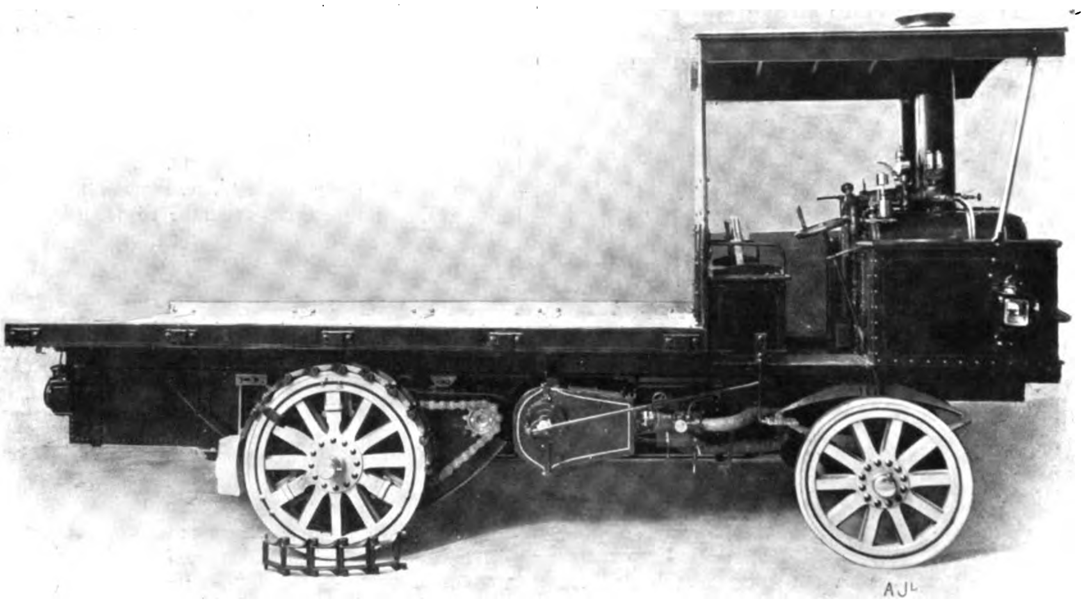
compound, and has double-acting cylinders; the valves are of the piston type, and a single eccentric form of reversing gear is employed. The boiler is of the water-tube pattern, in which the steam chamber is constructed of solid drawn steel, and the well-known Mannesmann tubes are made use of. Several of the heavy steam trucks referred to above are illustrated by us, although the majority of those mentioned have already been fully dealt with in our columns in the past.

Amongst steam vehicles for private use, the Chaboche steam car made its first real appearance for sale in this country at the Show, the Chief British Depôt showing a chassis and a complete vehicle, which were illustrated in the first part of a separate article in our issue of March 28th. Gardner-Serpollet vehicles were again exhibited, both by the Chief British Depôt and by the Speedwell Motor Car Company, and the New Automobile Company showed the latest Miesse models, which have been described in very great detail by us recently. The Albany Manufacturing Company's steam car was on view, and another new English built vehicle, with a flash boiler system, was to have been shown in operation by the Warfield Company, but unfortunately was not finished in time.

As usual, several light steam cars of American construction were shown by the English representatives, Mr. J. L. Sardy having one of the new Saracen vehicles, the Weston Motor Syndicate being again well represented, and the Toledo cars being shown by the Victoria Carriage Works. J. Cockshoot and Co. once more displayed samples of the Stanley steam car which they have put on the English market.

The chief attraction in the way of the electrical vehicles, apart from the Hart combined petrol-electric car, were the Waverley vehicles, shown by the manufacturers. These neat and well-built little machines attracted no small amount of attention, much of which was, doubtless, due to the low price at which they are being put upon the market. Amongst other new machines was an electric omnibus on the stall of Messrs. Salmons and Sons, this being an electric public-service omnibus built by the Stoewer Company, of Stettin. This machine, which is fitted with solid rubber tyres of the "Peter" Union type, has a seating capacity inside for 14 passengers, and is, we understand, to be tested by the London Road Car Company. It is said to run at a speed of about 14 miles an hour, and to be capable of travelling about 75 miles on one charge. Each of the rear wheels is driven by a separate motor, the shafts of the latter carrying pinions which gear with internal spur-wheels fixed to the former. Leitner batteries are to be used with it on the trials.

Mr. Hart exhibited a standard chassis, showing the construction which he has adopted for his electric vehicle. In general respects it resembles the Contal system and the cars now being manufactured in England and sold by the Electromobile Company, Limited.

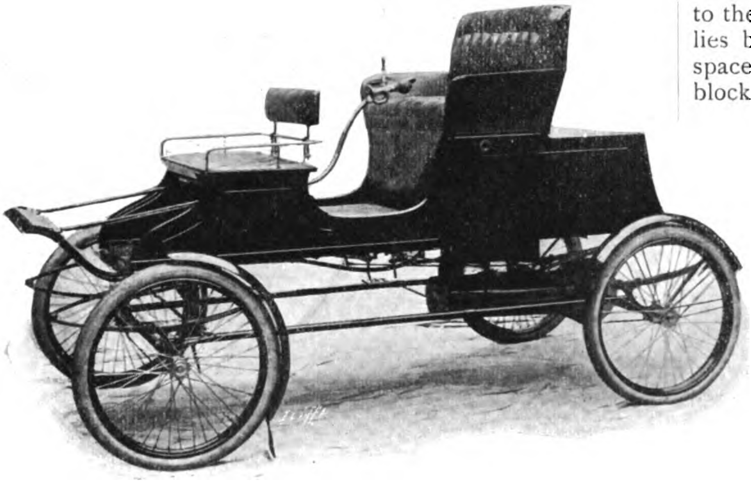


The Savage Steam Lurry. With one half of non-slipping device detached from rear wheel.

One of the largest electrical vehicles which has as yet made its appearance is the 2-ton electric truck which was on the stall of the Anglo-American Motor Car Company. The machine is capable of running about thirty-three miles with one charge, and is equipped with the Gibbs system of transmission and control. This truck had a very imposing superstructure surmounted by a canopy, and fitted with side-blinds. It has been built for light goods traffic, the equipment suggesting the transport of fruit.

Other electric vehicles included those built by the well-known Krieger Company and by the Milde Company; the former was shown by the Krieger Electric Carriage Company, and the latter by the Lancaster Motor Garage. The combined petrol-electric Milde vehicle, which we described in connection with the Paris Exhibition, was on view. The Still electric cars were again brought before the notice of the public by Shippey Brothers.

All the well-known tyre companies were once more strongly represented in the Hall, and the various devices which have recently been introduced for the prevention of side-slip were to be seen. The Dunlop and the Collier Companies did not fail to take advantage of the success met with by them in last year's tyre trials. The chief feature of the Dunlop exhibit was, of course, their new non-slipping cover, the cross grooves in which appear to have almost entirely eliminated the one great bugbear to motorists when travelling over slippery roads. This new form of tyre, coupled with the excellence of manufacture which is now being obtained, has enabled the Company to maintain their high position in the trade. The Collier Company, who are justly proud of the durability of their tyres, had samples of the various sizes and types which are giving so much satisfaction to their customers, and it was evident that the performance of their tyres in the great contest has drawn an enormous amount of attention to this enterprising concern.



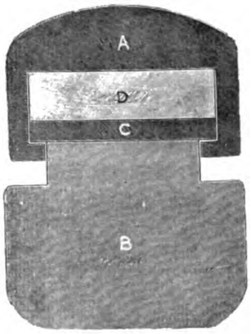
The Stanley Steam Car.

The North British Rubber Company with their celebrated Clincher-Michelin pneumatic tyres in great variety, and the Clipper Pneumatic Tyre Company and the Goodyear Tyre and Rubber Company were also well represented. The Clipper Company's non-skidding tyres, in which it will be remembered that metal studs with roughened heads are fitted at intervals into the tread, were examined with a good deal of interest. The Rucker and the Martin tyres were again on view, and the British Motor Tyre Syndicate, of Manchester, showed a pneumatic tyre in which the cover is fixed to the rim in a somewhat unusual manner, being locked in place not by the air pressure, but by an annular and central ring which keys it in place against the detachable sides of the rim.

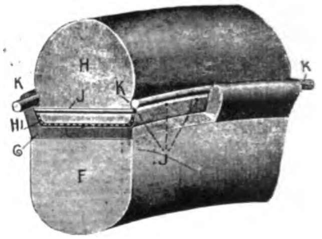
The South British Trading Company exhibited the Fisk tyre, which was recently illustrated by us in connection with our description of the latest Locomobile cars, and the "Peter" Union tyre, which we dealt with in our Paris Exhibition article, was shown by Salmons and Sons.

Amongst solid tyres the new Firestone tyre, which is being taken up by J. W. and T. Connolly, was most noticeable. The construction of this is seen in the accompanying illustration, where it will be noticed that steel wires, J, pass at intervals transversely through the rubber, H, and the tyre is held in place to the rim, G, by the wires, K. The tyre itself is made of solid rubber, and a facing of canvas, H^{1}, is vulcanised to it where it comes into contact with the rim and the retaining wires. The Firestone tyre appears to have done exceptionally well in America, not only for vehicles of moderate weight, but also for the very heaviest. The exhibitors are no longer selling their well-known "Ideal" tyres for vehicles weighing more than 15 cwt., the Firestone tyres being recommended by them instead; for lesser weights, however, the "Ideal" can still be obtained. These new tyres have been put on the market for vehicles weighing from 8 cwt. to five tons. A section was shown of a 4-inch tyre which had stood a prolonged test on a 5-ton vehicle, and in which the rubber had been worn away equally without in any way affecting the security of the fixing, or the reliability of the tyre.

The Buckingham Patent Rubber Tyre Company showed wheels fitted with their special tyre, of which we give illustrations. The steel rim, A, is made in sections, which are forced into place about the steel rim, C, the rim being fixed to the felloe of the wheel. A cushion of very soft rubber lies between the steel sections, A, and the rim, C. The spaces between the sections, A, are filled up by hard rubber blocks, E. These tyres are said to be capable of standing unusually heavy loads, and to be remarkably noiseless. They have been tested on heavy lurries in Liverpool.



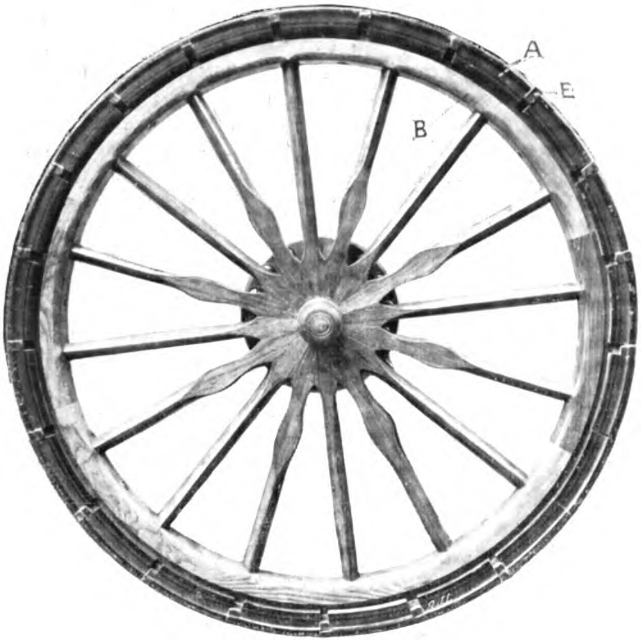
Cross-section of the Buckingham Tyre.



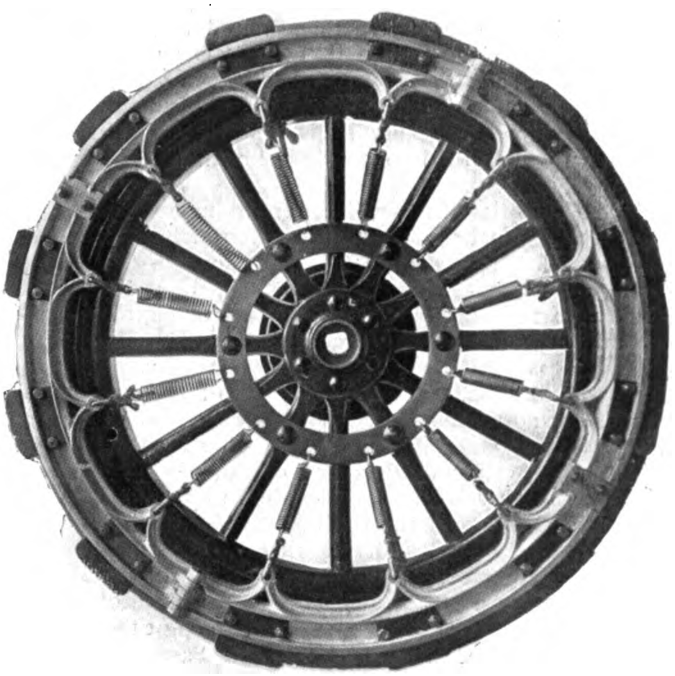
Section of the "Firestone" Solid Rubber Tyre.

The "Gare" Patent Cushioned Tyre Company demonstrated the special construction adopted by them, and already illustrated by us. They also showed an interesting novelty in the way of wheels for heavy traction. The wheels are built up of very hard wood, the grain running radially. The blocks are wedge-shaped, and are fitted together with sheets of rubber between the joints. They are held together near the periphery by steel flanges, and the wood projects slightly beyond these. The wearing surface is formed by the wood, and a certain amount of resiliency is afforded by the rubber. These wheels have been tried on heavy vehicles in Manchester, and a set has been tested by the Liverpool Fire Brigade.

Mr. J. F. Pease, of Darlington, exhibited a combined pneumatic and solid tyre known as the "Telo," as also a special form of wheel which is stamped out of steel. The "Telo" combined tyre and wheel are said to not only give the resiliency of the pneumatic, but to enable vehicles fitted



The Buckingham Wheel, with Steel and Rubber Tyre.

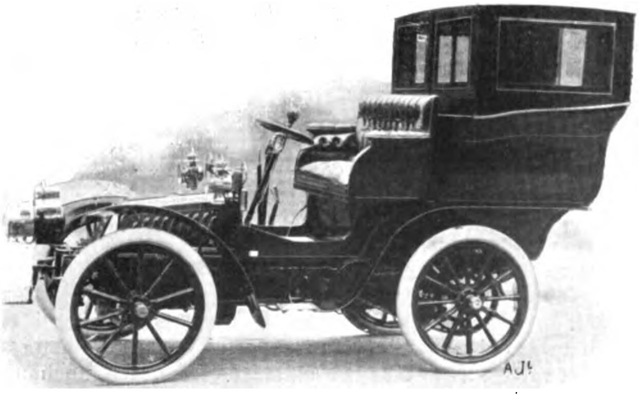


The Corbet's Slip Preventer.

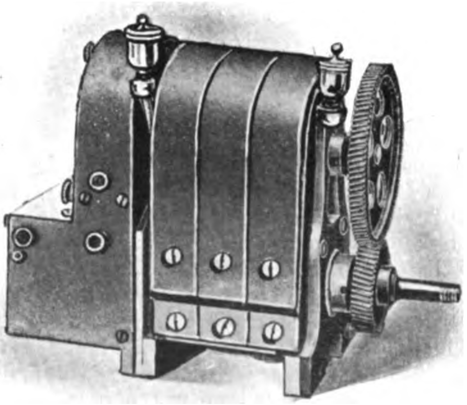
with them to be run to their destination, even if the inner tube should burst. Another wheel having a similar object was exhibited by the Pneumatic Endurance Wheel Company. This practically consists of two wheels, which are connected together in an ingenious manner near the hub, so as to have a sliding movement relatively to one another. The inner one is fitted with a pneumatic tyre, which forms the resilient support for the rim of the outer one.

Amongst the anti-skidding devices shown, the Parson's Non-Skid Company made a good display with their interesting and well-known devices. The Corbet's Slip Preventer was also exhibited, being in evidence on the stall of the British Automobile Commercial Syndicate. We give an illustration of this device, from which it will be seen that a number of hard steel segments are placed so as to come edgewise into contact with the road on one side of the tyre, and that they are held in place by a metal ring which is made by two hinged-together, semi-circular pieces. The steel segments are bolted to the ring, so that they are renewable, and the ring is attached flexibly to the wheel by means of spiral springs which secure it to an inner ring bolted to the spokes. The inner ring is permanently fixed in place, but the other portions of the device can be easily removed by unhooking the springs from it. The hinges enable the outer ring to be folded up so as to occupy less space.

The Duchess Motor Company showed one of their special bodies fitted to an 8-h.p. Mors car. The accompanying illustration shows its appearance as a covered vehicle. The removable top to the tonneau is so made that



8-h.p. Mors, fitted with Duchess Body, the special Removable Top in use.



The Eisemann Magneto Ignition Apparatus.

it can be folded up entirely into a very small space, and the body is so constructed that a space is provided for the top to fit into it between the tonneau and the back of the driver's seat. Considerable ingenuity has been exercised in the design, and the advantages of being able to convert an open car into a closed one at a few moments' notice, and at any time, are secured. The provision of a space for the top to fit down into does not impair the appearance of the vehicle.

The accessories of every kind were as numerous on this occasion as usual, and all the best-known firms were well represented. The Hydroleum Company, of Willesden, again demonstrated their special apparatus by which ordinary paraffin oil can be used instead of petrol on light steam cars of all kinds, and their corner of the Minor Hall was usually crowded with interested spectators. Amongst firms who have made a special feature of supplying gear-wheels for automobilists mention may be made of the Motogear Engineering Company, of City Road, E.C., on whose stall a variety of different forms of gear-wheels were shown. Engines of all sizes were shown by a large number of makers and agents, the Begbie Manufacturing Company showing Aster engines in addition to their well-known radiators and other accessories. Many firms who have turned their special attention to the manufacture of wheels for automobiles were well represented, amongst these being Messrs. Smith, Parfrey, and Co., and Savage Brothers, Limited, besides others whom consideration of space prevent us from mentioning.

One of the most extraordinary exhibits was a petrol engine shown by Madame Lockert for M. Alexandre Primat, in which the cylinders are formed so that the pistons travel over a circular path. There are two pistons in each cylinder, the explosions occurring between them. They are connected with a crank-shaft in an ingenious manner, but, from a cursory inspection of the engine, we failed to see any justification for the complication and difficulties of construction which are involved by it.

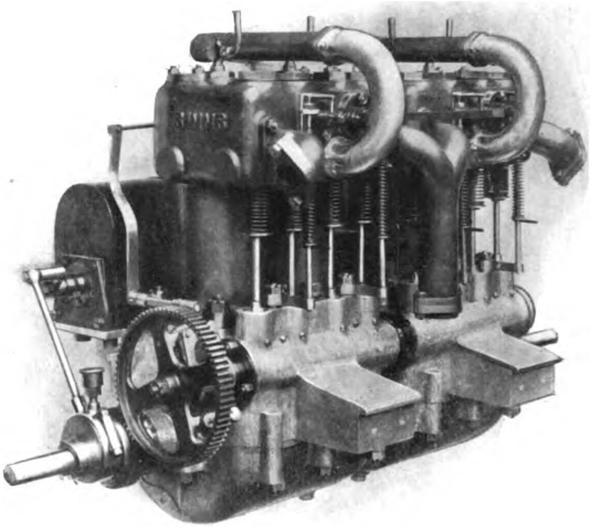
Our last illustration shows the magneto and commutator apparatus employed for the Eisemann ignition system, in which the low-tension current generated is transformed up to a high tension, and is then distributed to the ordinary ignition plugs now in use. It will be remembered that we referred to the adoption of this system by the Germain Company recently, and that one of the M.M.C. cars at this Exhibition was also fitted with it.

THE favourite amusement of the Prince of Monaco is riding a motor bicycle.

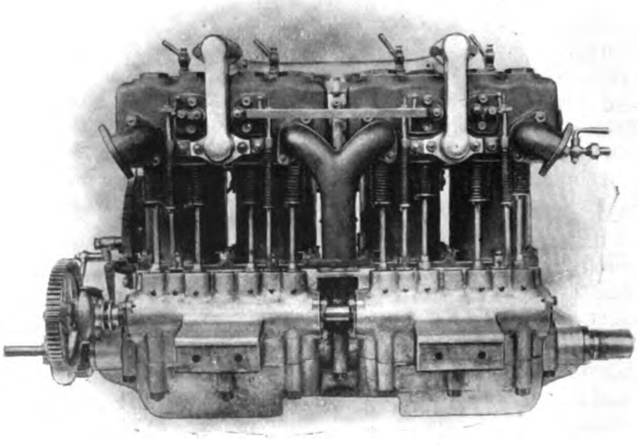
THE motor car development of Ireland seems to be progressing at speed. The Earl of Leitrim is arranging for three powerful motor coaches, which are being built by the Messrs. Stirling Motor Carriages, Limited, and are capable of carrying fourteen passengers and luggage, and climbing the mountainous routes of his district in the north-west, for opening up tourist traffic in that picturesque neighbourhood. The route on which these coaches will run commences at Strabane Railway Station and runs from there to Rosspenna, at which latter place is a golf ground and a well-appointed hotel. The district is wild and beautiful, and we trust that this endeavour to supplement the railway accommodation, which is even more inadequate in this part of the country than elsewhere in Ireland, will be in every way successful.

THE FOUR-CYLINDER SIMMS MOTORS.

OUR illustrations show the two sizes of 4-cylinder engine which are built by the Simms Manufacturing Company, and which have recently been put on the market by them. These engines are similar to one another in every respect, and are very neatly designed. The smaller develops about 20-h.p., and the larger about 30-h.p., when running at a speed of something like 1,200 revolutions per minute. The bore, stroke and compression of the two, respectively, is 95 by 110 mm. at 70 lbs. per sq. in., and 110 by 110 at 90 lbs. per sq. in. The weight of the larger is 308 lbs. approximately, to which has to be added about 56 lbs. for the flywheel.



20–24-h.p. Simms Petrol Engine.



30–35-h.p. Simms Petrol Engine.

The cylinders are cast in pairs, the heads and valve-chambers being made in one piece with them. The inlet valves, as well as the exhaust valves, are mechanically operated, and they are all arranged on the same side of the cylinders. The inlet valves for each pair of cylinders are placed so that there is a common passage to them from the induction pipe, and the exhaust valves consequently communicate with separate exhaust pipes. Low-tension igniters are provided for each cylinder, and are fitted so that the contact points lie above the inlet valves. Inspection plugs are fitted above each of the valves so that it is only necessary to remove a plug (and a cotter from the valve spindle) in order to take either of them out. The inlet valves and the exhaust valves are interchangeable.

The crank chamber is of aluminium, cast in two pieces, and it provides a large intermediate bearing, as well as the end bearings for the crank-shaft. The joint is arranged horizontally through the bearings, and the studs by which the two portions are held together are fixed into the upper part, the nuts screwing up from beneath. A single cam-shaft is provided for operating all the valves, and it also carries the cams which actuate the igniters. The cam-shaft is made in two pieces, one for each pair of cylinders; they are connected together centrally by a pin. The bearings for each portion of the cam-shaft are fixed in place by flanges, and all the cams are enclosed. The cam-shaft is driven, in the ordinary manner, by spur-wheels in front, and a centrifugal governor is fitted in the larger wheel, it being connected, as usual, with a throttle-valve fitted in the branched induction pipe leading from the carburettor to each pair of cylinders.

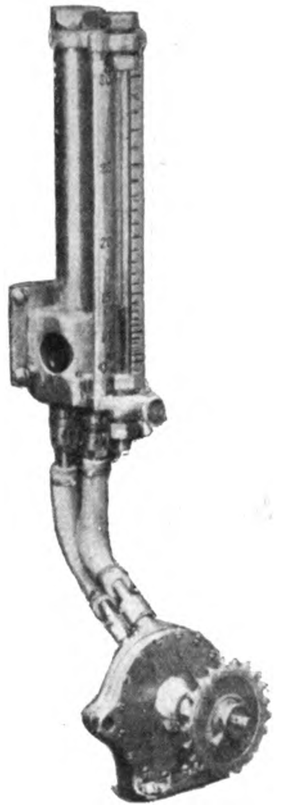
The magneto is of the Simms-Bosch oscillating type, and is fixed upon a bracket on the crank chamber; it is operated by an eccentric on the front end of the crank-shaft. One wire from it is earthed to the engine, and the other is led to a copper strip which is not covered with insulating material, but which is connected to the insulated terminals of the igniters. The carburettor is mounted on the same side of the engine as the magneto, and is of the float-feed type.

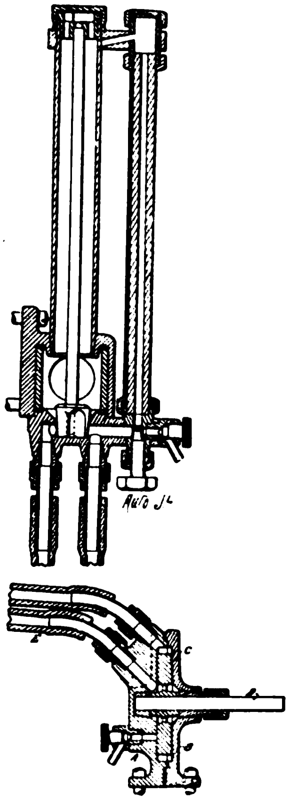
Lubrication of all parts has been carefully provided for, and the system for circulating the oil round the bearings and other moving parts is automatic. The water-jacket surrounds the cylinder heads and the valve-chambers; half-compression-cocks are fitted into the tops of the cylinders. The engines are, as we have said, nicely designed, and are of very neat construction; they are, of course, of British manufacture throughout.

The Turgan-Foy military wagon which started for Vienna from Paris the middle of last month successfully reached its destination, having occupied 15 days to cover the intervening distance of 1,600 kilometres. The Austrian authorities under whose directions this test trip was carried through, day by day communicated their instructions to the driver of the vehicle as to his next day's run, so as to thoroughly prove whether these vehicles would be of practical service for military purposes. The vehicle was provided with three beds, and was accompanied by M. Turgan personally and two mechanics. A load of about 6 tons was conveyed, Strasburg being reached in three days from Paris. Nine days were occupied from Strasburg to Salzburg, and three days from there to Vienna. The roads through the Black Forest and generally on the Austrian side were bad and very difficult to traverse, but no breakdowns have been reported, and the test appears to have been very successful throughout. All sorts of fuel were used as and when obtainable, including ordinary coal, wood, charcoal, &c., and there is no doubt that the success achieved will result in mechanical traction being largely introduced into the Austrian army.

THE VEEDER TACHOMETER.

The Veeder Tachometer, of which we give a view and sections, is an arrangement which has, according to the *Horseless Age*, been introduced in the United States. It depends in principle on the fact that the column of water raised by a centrifugal pump (with plenty of slip) will be more or less proportional to the speed at which it is driven. The tachometer consists of a vertical pipe, somewhat resembling the water gauge of a steam boiler, and a larger reservoir parallel to it for containing the bulk of the liquid. A centrifugal pump, driven by a chain from a moving part of the car, is arranged to pump the water out of the reservoir and up into the indicator tube. The faster the pump revolves the higher the water rises in this tube, and it may be graduated by experiment in miles per hour. We gather that the results obtained are only approximate, but the apparatus is simple and handy, and that is probably its principal attraction.

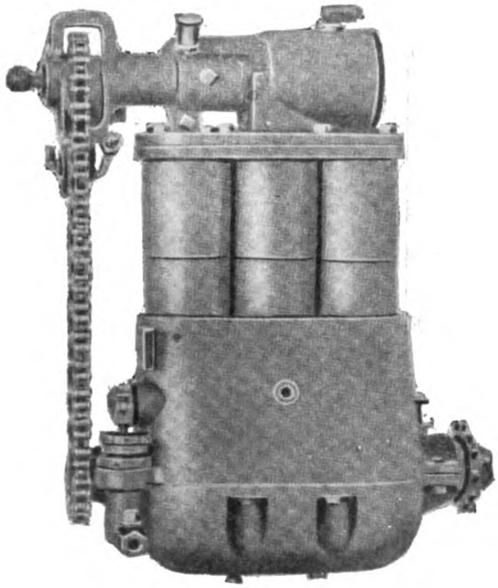




Great activity is apparent amongst dirigible air-ship constructors. M. Santos Dumont is daily expecting to be able to make his next essay. The recent prevailing gales have done considerable damage to his new shed at Neuilly, but fortunately the balloons have not been injured. Messrs. Lebaudy have been more fortunate, and since their first ascent have been out twice at Moisson, in each case exhibiting remarkable control over the evolutions of their air-ship. With improving weather they hope to demonstrate shortly on an extended scale the material advances which they have made in their science.

THE "JAXON" STEAM ENGINE AND CAR.

The engine, of which we give an illustration, has recently been put on the market by the Jackon Steam Car Company, of Jackson, Mich. It is a 3-cylinder engine of single-acting type, and, in consequence, possesses the advantages of having no stuffing boxes. The steam is admitted to the cylinders by a rotary valve driven from the crank shaft by a chain. The valve is so constructed that the steam pressure keeps the valve faces up against the ports, any wear being automatically taken up in consequence. The crank-shaft is a solid steel forging, and has four large plain bearings. The connecting rods are fitted with interchangeable bronze bushes, held in place by removable caps secured by steel studs. The car fitted with this engine is of the usual light American type, except that no reaches are employed in the frame. The wheel base is 6 feet, and the track about 4 feet 8 inches. The engine is mounted under the seat in much the usual way, and is supplied with steam from a boiler of the ordinary fire-tube type, 19 inches in diameter, and having 525 copper tubes, 14¼ inches long. The drive is by a chain on to the live rear axle. The engine develops nominally 6-h.p., and is reversed by a spiral sleeve on the valve shaft, which is forced in or drawn out to rotate the valve relatively to the crank-shaft.



A storm in a teacup appears to be raging with some fury in the town of Glasgow. It is one of those sort of disputes connected with trades unionism that are calculated to exasperate the uninitiated. According to the principles prevailing in trades unionism, cabinet makers are not permitted to do coachbuilding work. In Glasgow they have recently taken to build bodies for motor cars. The Coachbuilders' Union maintain that this is a direct violation of the sacred principles referred to. The cabinet makers, however, insist that motor car building is a new industry, and that they are perfectly entitled to use their faculties for making a living and obliging their employers in that direction. Neither party are disposed to yield, though how the non-yielding of the coachbuilders will prevent the cabinet makers from continuing to build motor car bodies is at present unapparent.

IMPROVEMENTS IN VAPORISING HEAVY OILS.

The importance of being able to employ heavier types of fuel in all classes of steam car is being more and more generally recognised, but even in those steam cars in which the problem of using heavy oil as fuel has been most successfully solved certain difficulties are still encountered unless proper care is exercised by the driver. Those who have been working at this problem may read with interest the lecture recently delivered before the Society of Arts by Mr. Arthur Kitson on the subject of oil incandescent lighting. In adopting liquid fuel of the ordinary paraffin-oil type to incandescent lighting on a commercial scale, Mr. Kitson has encountered and successfully solved many of the difficulties which confront the engineer when applying the same fuel to the firing of light steam boilers. In all the forms of Kitson apparatus the oil is vaporised in very much the same way as in a number of heavy oil burners for steam-raising purposes. The vaporising tube also has to be subjected to a preliminary heating up before the oil is turned on. It is not, therefore, surprising to learn that carbonisation of the vaporising tube is liable to occur in all forms of the Kitson apparatus. It may be of interest to some engineers to describe the method by which, in the case of the Kitson lamps, the difficulty has been obviated. It is a well known fact that when oil is passing between two surfaces, one or both of which are not at the correct temperature for effecting its proper vaporisation, the carbon formed deposits on the cooler surface. Mr. Kitson accordingly made use of this fact to practically get rid of the carbonising difficulty altogether. Along the middle of the vaporising tube he inserts an iron rod, which, owing to its position, is cooler than the outside of the tube. Practically all the carbon deposits on this, and, by withdrawing it once every month or two, the whole of the carbon may be removed, the rod cleaned and reinserted. It certainly would appear that this device might be made use of with success in some types of heavy-oil burners for steam cars in which carbonising may have been found a difficulty. Another of Mr. Kitson's devices might, it would appear, also be adopted in certain cases for steam cars with advantage. Everyone knows that when heating up the vaporiser with methylated spirit or otherwise, trouble arises if the oil is turned on before the vaporising tube is sufficiently hot. In the Kitson lamps this is entirely obviated by the employment of a thermostatic valve in connection with the vaporising tube. This valve keeps the oil supply shut off until a temperature at which it will be vaporised with certainty has been reached, and it then automatically opens. If this were employed in certain varieties of burner for steam cars, unnecessary waste of fuel for heating up the vaporising tube would be avoided, and turning on the oil too soon would be an impossibility.

Extensive experiments are being carried out on the State railways of Saxony to test the practical possibilities of different forms of automobile railway carriages. One of the cars being tried is a Daimler, using alcohol as fuel, with seating capacity for 44 passengers and standing room for 10, the car being constructed on the corridor principle. A Serpollet steam car of about similar capacity is also being tested, and an electric accumulator car is shortly to be placed on the rails, so that the results of the three systems may be compared.

GORDON-BENNETT CUP RACE.

Thursday, July 2nd, has now been officially and finally fixed as the day on which the Gordon-Bennett Cup Race will be held.

Lord Dudley, the Lord Lieutenant of Ireland, will witness the race from the club enclosure, and will give a garden party at the Viceregal Lodge on July 4.

The cars entered for the Eliminating Trial for the third representative vehicle for Great Britain were duly weighed and inspected, according to the rules, at Humphrey's Iron Building Works in the Buckingham Palace Road, by Messrs. Worby Beaumont, Lyons Sampson, and Lancaster on Good Friday, the 10th instant. Four of these cars complied with the formality, viz., three 35-h.p. Napiers and one 80-h.p. Star, there being also in attendance Lieut. Mansfield Smith-Cumming with his 50-h.p. Wolseley racer, in the hope—doomed to disappointment—that he might possibly be permitted to take part in the Trial. His car, however, will be held as one of the "Reserves." The first Napier car scaled in racing trim 16 cwt. 3 qrs. 2 lbs., the other two cars, which were driven up with tanks and radiators filled, registering only 18 cwt. 1 qr. 10 lbs. and 18 cwt. 1 qr., respectively, being, therefore, well within the maximum limit of 1,000 kilogs. (19 cwt. 2 qrs. 21 lbs.). Ready for the road, with the driver and mechanician on board, these cars scaled respectively 21 cwt. 3 qrs. and 21 cwt. 3 qrs. 4 lbs. The Star car was considerably heavier, and with everything allowable removed turned the scale at 19 cwt. 1 qr. 15 lbs., and when loaded with driver, petrol, and water the weight totalled up to 23 cwt. 1 qr. 16 lbs. Subsequently the cars were driven to Piccadilly, where, after lunch, the rest of the formalities were completed by carefully examining all parts to see that they were entirely of British manufacture and affixing the Club stamp to the essential portions of the machinery—viz., cylinders, gear-boxes, axles, and crank chambers, the frames being sealed. It is possible that the third Napier car will be driven by Mr. J. W. Stocks in the event of the Star car being beaten in the eliminating test which will take place on the Duke of Portland's Welbeck estate on April 25th. By permission of the Duke of Portland members of the Club with their cars will be able to witness these trials on the Clipstone private road, and competitors will also have the opportunity of trying the course beforehand.

Competitors for the two places in the American team were last week reduced to three—viz., Messrs. H. S. Harkness, Percy Owen, and L. P. Mooers, as Mr. C. W. Matheson, of Grand Rapids, forfeited his claim to compete in the Eliminating Trial. Alexander Winton is nominated for the team without competition. The preliminary trial took place last Tuesday on a road on Long Island. Mr. Harkness having broken an axle last week was not ready, and he may therefore be ruled out by the A.C.A. from the competition, as his plea that he did not know of the date of the trial appears to be unconvincing. Mr. L. P. Mooers' "Peerless" car is of very light construction. Mr. Percy Owen, on his Winton car, was timed for 5 mins. 55 secs. over a distance of five miles, a strong side wind blowing at the time. Those upon whom the final choice falls will probably start for Europe about the middle of May.

Mr. Henry Farman will take the place of his brother Maurice, as one of the French representatives, who has gracefully withdrawn in his favour.

During the holidays Mr. Roger W. Wallace, the President of the Automobile Club, accompanied by Mr. Julian Orde, the new Club Secretary, crossed to Ireland via Holyhead with a 9-h.p. James and Browne car, nominally for an Easter tour in Ireland, but with the main object of running over the Gordon-Bennett course and to confer with the Irish authorities as to the safeguarding of the road during the race. During their stay they will consult with Sir Henry Robinson, Vice-President of the Local Government Board, Major-General Sir. G. de C. Morton, commanding at the Curragh, and Colonel Neville Chamberlain, Inspector-General of the Royal Irish Constabulary. The Hon. C. S. Rolls, Mr. S. F. Edge, Mr. Chas. Jarrott, Mr. Harvey du Cros, jun., Mr. W. du Cros, and Mr. J. W. Stocks are also reported to have arrived in Dublin at the end of last week and carefully examined the roads over which in all probability three of them will drive in the race. We fancy, however, that the destination of at least some of these gentlemen was France, for a few trial spins on two of the Napiers.

A very generous offer is made by Messrs. John Hutton, Sons and Co., of 2, Dawson Street, Dublin. They have announced that they have made arrangements for garage accommodation for over 200 cars in Dublin, and offer this accommodation free of charge to any motorists coming over to Ireland. They are also issuing, post free to all applicants, a map of the course, giving a quantity of useful information and notes as to petrol depôts, &c. This firm's works are situated at 115, Summer Hill, Dublin, and during the Irish Fortnight they will be prepared to not only look after any small necessary repairs, but will undertake any more serious replacements at a moment's notice. Although petrol throughout Ireland is reported as being extremely scarce, owing to the transport difficulties raised by the steamship companies, Messrs. Hutton and Co. have arranged to hold a large stock of fuel in addition to lubricating oils and all possible accessories.

The number of prizes in connection with the Irish Fortnight are being considerably increased. Besides those already notified by us, Messrs. Wheatley, of Dublin, have offered a Cup; the Royal Ulster Yacht Club, Belfast, have presented a £50 Trophy for competition in the Speed Trial between Clough and Castlewellan; and the *Motor Cycle* have offered two silver Cups for the Motor Cycle Races at Phœnix Park, both to be won outright in the kilometre trials, one being apportioned to the 2-h.p. and one to the 3-h.p. class. A 20-guinea cup is also offered by Mrs. C. M. Lloyd, of Addington, to be competed for by ladies at the Phœnix Park Gymkhana.

For motor cycles the events set down for time trials on July 4th, when these will be held in Phœnix Park, are as follows:—Class 1, machines up to and including 2-h.p.; Class 2, 3-h.p.; Class 3, up to any power.

On July 7th, at Newcastle (Co. Down), a 4-mile race, open to the same three classes as above.

The estimate for the cost of making up the Irish roads comes out somewhat higher than anticipated. It is hoped, therefore, that those who have not already sent subscriptions to the Automobile Club for helping this good cause will at once communicate with them. In the meantime a supplementary list has been opened, to which Mr. Paris Singer has added a contribution of £100.

The Motor Boat event on July 11th in Queenstown Harbour will be over a ten mile course from a standing start. The entrance fee will be £10, half being returnable to starters. Entries close on June 10th.

Mr. R. J. Mecredy, of the *Irish Motor News*, has prepared a special map of the Gordon-Bennett course which will enable visitors without difficulty to select the most advantageous points to arrive at any part of the course. This map has been adopted by the Automobile Club as their official map, and we understand that it will be ready for issue about the end of the present month.

The deed of gift under which Mr. Alfred Harmsworth has presented his International Cup for motor boats, provides that the Cup shall be competed for annually under the racing rules of the Marine Motor Association of the United Kingdom. Each country may only enter three vessels, such vessels to be constructed wholly and in every particular in the country of origin. The motive power, provided it is wholly mechanical, is optional. Each vessel must carry not less nor more than two hands, of whom one must be the helmsman and the other a member of the competing club, and both hands must be natives or naturalised subjects of the country which they represent. All costs in connection with the organisation of the race shall be borne by the club holding the Cup for the time being, the club having right, however, to enforce entry fees towards this expense. An International Commission of the competing clubs will deal with all questions as they may arise, and rules affecting the conduct of the race generally will be settled by a committee composed of representatives of the Marine Motor Association, the A.C.G.B.I., and Mr. Harmsworth (the donor). Alterations in the rules will be made by representatives of these three and one representative of each club which competed in the last previous race for the Cup. Alterations in the rules will not be valid unless arrived at unanimously, except where the only objector is the holder of the Cup, in which case decision shall rest with the donor of the Cup.

Paris-Madrid.—There were over 270 entries in the Speed Class on Wednesday, the last day for single entry fees. The definite route for the Tourist vehicles has now been issued, starting on May 13th from Paris, Pougues being reached on this day and Royat the following day. Up to this point the prescribed route is obligatory on all competitors. Cars can travel how they wish for the next three days so long as they rejoin at the Agen Control on May 17th. Another two days' run in like manner brings them to St. Sebastian on May 19th, where the cars again report, resting in this town on May 20th. The remainder of the prescribed route is again obligatory up to and inclusive of Madrid, and is as follows:—May 21st, St. Sebastian to Bilbao; 22nd, to Vittoria; 23rd, to Burgos; 24th, to Valladolid; 25th, to Salamanca; and the 26th, Madrid. Arrangements have been made whereby the competing cars will be exempt from Spanish Customs duty.

LIGHT MOTOR VAN TRIALS, 1904.

Having considered the most suitable methods in the interest of the trade and the public for these trials, which are being organised by the A.C.G.B.I., the Society of Motor Manufacturers and Traders have drawn up the following recommendations for the consideration of the Club in deciding upon the regulations which are to govern the carrying them out. In most respects these agree with the resolutions already passed by the trade at their last meeting upon the subject.

It is recommended that the competing vehicles shall carry loads not exceeding 2 tons and driver, and shall be tried under conditions as nearly as possible approaching those which obtain in the work for which they are intended, the route to be the same for all vehicles, and four classes made, viz., vehicles designed to carry (*a*) 5 cwt. or under, (*b*) ½ ton or under, (*c*) 1 ton or under, (*d*) 2 tons or under. Two vehicles of the same make only to be entered in any one class by manufacturers or agents, the floor area to be limited in each class, and the entrance fee not to exceed £10. The trial to extend over a distance of 1,200 miles, to be covered in four weeks, commencing not earlier than April, 1904. The Judges shall not be members of, nor interested in, the trade, and one half of them shall be engineers and one half commercial men. The official observers shall report to the Judges only, and not deduct marks. Each vehicle shall carry the full declared load during the whole time it is under observation on the road.

In making the awards the working cost per ton-mile shall be taken into consideration, as also the selling price, the accessibility of gear, and of all valves and lubricators, the position of the driver, the brake power, and the appearance of the vehicle. Competitors to be allowed to carry signs of approved size of the maker's name. Every vehicle to be finished complete, and not in a temporary manner. Vehicles in every respect similar to those entered shall be on sale at the price declared for three months after the trial. Cars shall run five days each week, and may be overhauled and adjusted on the sixth in the Club depôts, all repairs and renewals being noted. Current taken by electrical vehicles to be registered. One hour daily at night to be allowed for cleaning, and one hour in the morning for adjusting, lubricating, &c., beyond this all time for these purposes to count against the vehicle. Hill climbing tests to be arranged over a suitable portion of the course.

We can hardly reconcile the suggestion that each vehicle shall carry its full declared load during the whole time it is under observation with the opening proviso that the vehicles are to be working under ordinary conditions as if in commercial use. Under ordinary conditions it is obvious that light delivery vans would be stopping continually delivering parcels and possibly even collecting them, and these are the conditions which should certainly prevail in these trials.

Vienna Heavy Vehicle Trials.—Organised by the Austrian Automobile Club, these trials commenced at the end of March, special commissioners from the military authorities being told off to watch them on behalf of the Government. Two classes were arranged, one for electric vehicles and the other for petrol or steam, the first-named being tested over a 35 kilometre route, the other vehicles covering a distance of 55 kiloms., including the Exelberg Mountain. The following are the firms and vehicles which took part, and the results:—

Austrian Daimler Motoren Gesellschaft, Wiener Neustadt.—14-h.p. 4-cylinder petrol military wagon. Weight, 3,240 kilogs.; load, 2,810 kilogs.; time occupied, 4 hrs. 2 mins.; fuel consumption, 25·5 litres; water, 12·5 litres; fuel consumption per kilom., ·55 litre; per useful ton-kilom., ·20 litre.

Austrian Daimler Motoren Gesellschaft, Wiener Neustadt.—15-h.p. 4-cylinder petrol omnibus. Weight, 2,300 kilogs.; load, 740 kilogs.; time, 3 hrs. 5 mins.; fuel consumption, 18·4 litres; water, 10 litres; fuel consumption per kilom., ·40 litre; per useful ton-kilom., ·53 litre.

Nurnberger Motorfahrzeug-Fabrik "Union."—7-h.p. 1-cylinder petrol wagon. Weight, 1,240 kilogs.; load, 1,960 kilogs.; time, 3 hrs. 37 mins.; Fuel consumption, 11·3 litres; water. ·27 litre; consumption per kilom., ·27 litre; consumption per useful ton-kilom., ·27 litre.

J. Lohner and Co.—Lohner-Porsche electric accumulator wagon. Weight, 2,425 kilogs.; load, 20·5 kilogs.; time, 2 hrs. 24 mins.; current consumption, 11,140 watt-hours; consumption, 175 watt-hours per useful ton-kilom.; per gross ton-kilom., 80 watt-hours.

Engel-Jenatzy de Moritz.—Electric omnibus. Weight, 3,465 kilogs.; load, 685 kilogs.; time, 2 hrs. 40 mins.; consumption, 80 watt-hours per gross ton-kilom.

Motor Bicycle Track Records.—On the 12th instant Maurice Fournier, on a motor bicycle fitted with a two-cylinder 22-h.p. Buchet motor, at the Parc des Princes track, Paris, lowered the 10 kilom. record to 6 mins. 44 secs., beating the previous record of Darioli on the Buffalo track by 3⅕ secs. Fournier won by about two lengths against M. Thé, who was riding a 14-h.p. motor, but at no time did Fournier really let his monster freak machine exercise its full power, or there is no doubt he could have done considerably better time.

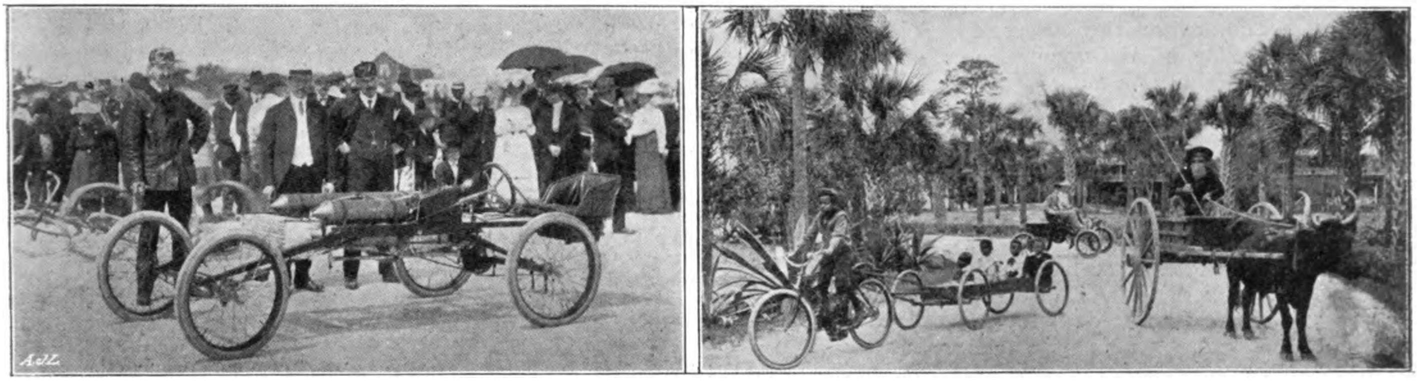
FOURNIER's record was not allowed to stand long as, on the following day, Sigonnaud on the same track, mounted on a motor bicycle fitted with a De Dion Bouton motor, covered the 10 kiloms. in 6 mins. 8⅘ secs., several laps being ridden at a speed equal to 100·279 kiloms. per hour, and ⅓ of a kilom. at 103·448 kiloms. per hour—a world's track record.

ON the Canning Town track last week the postponed motor cycle match between H. Martin and F. W. Chase was concluded in favour of Martin, who won three events to his opponent's one. The standing mile Martin won in 1 min. 34⅖ secs., and the two races over five miles from standing and flying starts respectively were also won by Martin, the first in 6 mins. 55⅕ secs. and the second in 6 mins. 32⅕ secs. Chase secured the flying mile in 1 min. 20 secs.

AT the Putney Velodrome on Bank Holiday the Silver Cup, offered by Mr. Mark Mayhew for the 5 miles open motor cycle race for 3-h.p. motors and under, was won with three laps in hand by T. E. Newman in 7 mins. 43⅗ secs. against F. E. Baker and H. Wingfield.

MONT CENIS hill climb is to be repeated this year on July 5th, the course being 23 kiloms., giving a rise of 1,500 metres. This fixture was started last year by the Italian journal *Stampa Sportiva*, but this year the organisation has been placed in the hands of the Turin Automobile Club.

THE new body to control motor cycling is to be entitled the Auto-Cycle Club, and be under the control of the A.C.G.B.I. The annual subscription will be one guinea, with, after the first year, an entrance fee of five shillings. The General Committee will consist of ten members of the Automobile Club, and eight representatives of the private members. The objects of this new body will be to organise contests on the track and trials on the road, adjudicate upon motor cycling records, keep a register of racing men, and issue them licences, to look after the touring interests of the members, and deal with legal and legislative matters. Members will have accorded to them the use of a committee room at the Club for meetings, &c., and pay reduced entrance fees in races, trials, &c., will have the use of the Club garage on certain terms. The finances will be under the control of the Automobile Club.



The Oldsmobile "Pirate," which made the mile record for 1,000-lb. cars.—Time 1 min. 6⅕ secs.

Local Transportation.—A Selection.

The Daytona-Ormond Beach Races.

THE American records made on the Daytona-Ormond Beach in Florida at the meeting held there from 28th March, which we announced in our issue of 4th April last, are now confirmed. Alexander Winton, with his "Bullet" car, brought the 10 mile time down to 10 mins. 26⅕ secs., and H. T. Thomas, on a 10-h.p. Oldsmobile touring car chassis, fitted with a racing seat, nicknamed the "Pirate"—a photograph of which we reproduce—made a record time, for cars under 1,000 lbs. weight, of 1 min. 6⅕ secs., beating the previous American best by 29⅖ secs. Oscar Hedstrom's time on an "Indian" bicycle for the mile was 1 min. 3⅕ secs. The event attracted a very large concourse of spectators, and it has been decided to make it an annual fixture. The sand course, although extremely hard, was found to give but an indifferent hold at high speeds to the tyres, and in the case of motor bicycles the fine sand thrown up into the chain in travelling was found to be a source of serious trouble. The times in each case for the kilometre records were:—For 2,000 lbs. vehicles, Winton, 32⅘ secs.; for cars under 1,000 lbs., Thomas, on the Oldsmobile, 42 secs.; and motor bicycles, Hedstrom, on his "Indian" machine, 39 secs.

OVER twenty-four entries have so far been received for the Glasgow to London Non-Stop Trial being held next month. These include the following:—A Delahaye, a Rochet-Schneider (Capt. H. H. P. Deasy), three Argylls, a 24-h.p. De Dietrich (Mr. Charles Jarrott), a 4-cylinder Elswick car (Mr. W. H. Kingsbury), two 10-h.p. Lanchesters, a Gladiator (Miss Dorothy E. Levitt), a 12 and 24-h.p. Georges Richard, two 4-cylinder Sunbeams, a 6-seated steam phaeton (Middleton and Townsend), an Arrol-Johnston dog-cart and a 6-seated carriage, two 10-h.p. Wolseley tonneaus, a De Dion Bouton (Mr. J. W. Stocks), a 3-cylinder Brooke (F. F. Wellington and Co.), a Farman tonneau, and a 14-h.p. Chenard and Walcker car.

THE particulars of the hill climbing competition organised by the Sheffield and District Automobile Club, and to be held on May 16th, are now issued. It will take place under A.C.G.B.I. rules. The hill chosen is Padley Wood Hill, the start being near the Maynard Arms Hotel, and the finish near the Fox Hounds Inn. The competitors will each have a flying start, and will follow one another at intervals of three minutes. There will be two classes, one for cars and the other for cycles, and all vehicles must be driven by the owners, and be their *bonâ fide* property at the time of entering. The entrance fee is 5*s.* for a car and 2*s.* 6*d.* for a cycle. Applications must be with the Secretary by April 25th. One trial only will be allowed, and cycles must not be pedalled after passing the starting line. Two challenge cups, one for cars and one for cycles, have been presented by Mr. Harvey Foster, the President of the Club, and these will be competed for twice a year, and become the property of any member winning three consecutive events. In addition a medal will be accorded for each event.

The "Sud-Est" or Aix Fortnight programme of events, to be held from June 14th to 28th, in the present temper of the French authorities may have to be considerably modified, if not altogether abandoned, as most of them are arranged to take place on the public roads.

The heavy vehicle trials which have been organised by the German Agricultural Society in Berlin, originally announced to take place commencing June 18th, will now start on May 25th and last about five days. These trials are particularly adapted to agricultural requirements in Germany, and are receiving strong support from the German Emperor. One of the requirements will be that the vehicles shall travel at not less than an average speed of 5 kiloms. per hour.

Only a few years back a considerable sprinkling of hotel proprietors and licensed victuallers in outlying country districts, had extremely unpleasant and practical methods of exhibiting their prejudice against automobiles and their owners. Boniface is proverbially a shrewd man, and it has taken a very short time for him to perform a complete *volte-face*, having once realised the supremely important part which the increase of automobilism is likely to play in the future profits of his business. In many cases where the automobilist some years ago was treated with scant courtesy, he is now cordially welcomed, and it is the exception in the majority of country districts to find a town which has not now one or more enterprising hotel proprietors who have gone a step further, and made special accommodation in the shape of washing arrangements, inspection pit, and the keeping of a supply of petrol, to meet the peculiar requirements which have been found necessary for the touring automobilist. As we have already said, this change of attitude has come about in the individual licensed victualler very considerably, throughout the country. We notice that the *Licensing World*, the official organ of the Licensed Victuallers' Central Protection Society, also recognising the important part which automobiles are likely to play in the future of country inns and hotels, have, in a recent article, strongly advocated the encouragement of this class of customer. After reviving memories of the decay and ruin of coaching inns and provincial hostelries throughout the country, brought about last century by the advent of the railway, the article points out that:—

"There is yet another class of hostelry which languished much longer than the coaching inns, where travellers dined while fresh horses were put to their post-chaises, or slept when bad weather or fatigue prohibited further progress. Scattered up and down throughout the length and breadth of the land were thousands of roadside inns, which, as travellers by horse and vehicle became absorbed by the new railways, fell into parlous plight. In the words of a critical novelist, 'they fell asleep when Puffing Billy came to stay, and only woke to assume a dozing condition when the bicycle made its advent.' If, however, the bicycle brought much-needed custom to the quiet inns still remote from railway communication, the motor car promises them a revival of the prosperity they enjoyed when Queen Victoria came to the Throne, and chariots, po'chays, and waggons halted with profitable frequency. There is a roadside inn on the Great North Road, not far from the border line which divides Westmoreland from Yorkshire, which, typical of many others, exactly illustrates the transitions referred to. In the 'forties' it was a fairly large house; every stall in its long range of stabling was occupied. Night after night lights shone from its latticed casements, and at frequent intervals during the day travellers and equestrians halted for rest and refreshments. Then came the age of the iron road. Its customers fell off, the stables and out-houses fell into a ruinous condition, and house and host alike fell into a lethargic state, with hardly energy enough to supply the wants of the pedestrian on a walking tour, the farmer jogging home from market, or the few labourers of the immediate district. Decades passed before the embryo hobby-horse was succeeded by the bone-shaker, which, in its turn, gave way to the bicycle. Clubs were formed, the members of which, mounted on their sixty-inch 'ordinaries,' toured all over the land, and explored districts where even the omnipotent railway had not penetrated. Mine host heard them coming, roused from his lethargy, and set his house in order for the new order of guests. They brought with them prodigious appetites, and in the old kitchen, with its cavernous fireplace, where fat capons, stubble geese, and saddles of mutton once roasted in all their glory, constant relays of ham and eggs, steak and onions, or fried sausages were prepared—simple viands, the profit on which, however, warranted the re-painting of the old signboard, the furbishing up of the quaint but cosy chambers, and the adaptation of some of the long disused stables for the safeguarding of the 'steely steeds' of the new patrons. The tall 'ordinary,' with its many dangers, gave way before the advent of the 'safety'; cyclists increased and multiplied; and on fine Saturdays and Sundays throughout the year, and during the summer holiday season, the old house was fairly busy.

"If the spread of cycling gave such a spurt to the business of the long-neglected roadside inns, what may we not expect from the advent of the motor car? The cyclist—unless he be of the scorcher variety—is content with a modest forty to fifty miles a day; he cannot pedal at his best if he drinks too freely; and, as a rule, he is satisfied with that moderate fare and accommodation which means moderate charges. His expenses, when on tour, rarely exceed ten shillings a day; and he may halt at five or six houses from sunrise to sunset. But the man who 'motes' is a customer of another class. If he can afford £600 or £700 for his Panhard or his Daimler, and the expenses of running the same, he can afford superior accommodation at the hostelry of his choice; and, enjoying a good dinner, does not grudge paying for it. He can cover his 100 or 150 miles a day without exertion.

"The devotee of the motor car rarely tours alone. He likes to 'make up a party' for the run; and when that party, overtaken by the shades of evening, or attracted by the beauty of the scenery, decide to put up for the night, the 'little bill' which they settle ere leaving in the morning, is a very welcome addition to the week's drawings of the house. What wonder that the revival of the roadside inn, commenced by the advent of the cycle, promises to be perfected by the coming of the motor car? Even in out-of-the-way places, wise landlords are already providing suitable garage accommodation for the horseless vehicles, and a capable mechanician, of the handy-man-engineer order, is often to be found attached to the staff. In the storerooms supplies of olives, caviare, sauces, and various other delicacies demanded by the new order of guests, are duly placed; the cuisine is improved to suit town palates; and, as has been said, every effort is made to suitably supply the new demands which are springing up so rapidly. That the motor car has come to stay is certain, and it seems equally certain that the industry is destined to revive the old-time reputation for comfort and hospitality, which tradition attributes to the country inns of Merrie England."

With very few fashionable people left in town, Good Friday was selected by the Metropolitan Police as a likely day on which advantage of the absence of traffic in Hyde Park would be taken by automobilists to put on a little speed in this delightful playground of London. A fifth of a mile had therefore been carefully measured off on the straight road ending at Queen's Gate, and quite a nice little "bag" of speed-limit exceeders was made, including Mr. Oliver Stanton, who elected to convey his accusers to the police station, where he was formally charged, in preference to handing the constables his name and address.

REVIEWS OF BOOKS.

"Secondary Batteries," by E. J. Wade. The Electrician Printing and Publishing Company, Salisbury Court, Fleet Street. 10*s*. 6*d*.

From time to time we receive inquiries from our readers for a good practicable and generally serviceable book on electric accumulators. Hitherto these inquiries have usually occasioned us a good deal of embarrassment. As far as our knowledge has gone there has not been a work in English which we could thoroughly recommend to our readers, and we have usually been compelled in such cases to fall back upon the German treatise of Schoop, which unfortunately has not been translated into English, and recommend that for the satisfaction of the inquirers. It is an unsatisfactory expedient, as very naturally a large number of people are interested in accumulators who are not acquainted with the German language, or, at any rate, not with technical German, which, as we have more than once had occasion to point out, is a very different affair from the conversational German of everyday life, a knowledge of which suffices for a tour on the Continent. The appearance of Mr. Wade's book helps us out of this difficulty. We shall have no hesitation whatever in recommending it most heartily to any future inquirers. It is practically everything which a book written at the present day on electric accumulators for practical men should be, and it is something more as well. It has the terse, concentrated style which only few people can write, and, on technical subjects, this sort of terseness is particularly acceptable. The subject of accumulators is a wide one, to a large extent it is a hackneyed one, and it is, therefore, little short of surprising to find that in dealing with a subject of this character, which suffers not only from these disadvantages but also from being highly technical, and sometimes involved, Mr. Wade should on almost every page succeed in presenting to his readers either an original view or a statement of the subject, which, if not original, is put in such an original way as to make highly attractive reading; in fact the book is quite remarkable throughout for its consistent interest. Perhaps to thoroughly enjoy reading it pre-supposes a certain amount of interest in the subject, but given that, it is almost difficult to lay the book down. There is scarcely a paragraph that does not take hold of the reader. It is a triumph of literary, scientific, and, at the same time, popular presentation.

Mr. Wade goes over the whole ground of the secondary battery, he is historical, he is theoretical, and he never gives too much from either point of view. He provides the reader, whether he be the general automobilist who only wants to know enough about accumulators to make him understand his ignition cells, or the electromobilist who wants really to understand the lighter types of secondary battery, or the station engineer to whom the fixed battery is a useful and reliable servant, with just the amount of history and theory that he wants to know, which he ought to know, and which will be sufficient for his requirements unless he desires to specialise to a very unusual degree. The growth of modern research, from the first experiments of Planté, and even before them, to the development of the modern lead cell in its various existing practical forms, is traced with lucidity. The various theories of the reactions which take place in the secondary battery are presented to the reader with singular clearness. A valuable and interesting chapter is given dealing with the various attempts (more or less abortive) to construct secondary batteries of other materials than lead, useful and valuable hints are given as to the mounting, management, and treatment of cells in actual practice, and their design, and a useful reference chapter on modern lead cells, including practically all the well-known types, concludes the volume.

The work also deals with subsidiary matters, such as the erection, connecting up, and management of batteries, and the chapter devoted to this subject contains one of the clearest and most succinct descriptions of the use and principles of the reversible booster which we have yet come across. We recommend the chapter, therefore, to a very large number of people, professional and otherwise, for there are many of these who talk large and largely about boosters, and have some idea of their value and use, who would be very non-plussed indeed if asked to explain what a reversible booster is, and why and how it boosts.

It must not be imagined, however, that the work is without the defects of its qualities. For one thing it has taken a long time in writing. It had been advertised for eighteen months by the *Electrician* as "in preparation," and for another six months as "nearly ready," before it actually issued from the press. Evidently some of the chapters were set up when these advertisements first appeared, and they have not been altogether re-written up to date. This is particularly noticeable in regard to portions dealing with the methods of Planté formation. They would have been up to date a year or eighteen months ago, but they really are not up to date now.

In dealing with the chemistry of lead cells also, the author lays himself open to some legitimate criticism. We would not like to say that he is alone in believing that the difference between the calculated and observed voltage of a cell is due to the equivalent of the heat of hydration of sulphuric acid liberated from the plate, but of all the theories on the subject that is probably the most difficult to substantiate. On some of the chemical questions connected with the subject also, Mr. Wade appears rather unduly dogmatic. He tells us in one place that the extra output of lead cells on heating have given rise to "rather wild talk" about lead cells acting as heat engines, which he dismisses curtly as quite untenable, "for if the cells really behaved in that way their E.M.F. would be subject to a large positive co-efficient, that is to say, it would rise rapidly on heating." We don't know nearly enough about the chemistry, thermo-dynamics, or interior mechanism of storage batteries to make a definite *à priori* statement like this. But we do know that the observed effect cannot be due to drawing merely on reserve energy, as Mr. Wade suggests, for if so the result would come to an end, or, at any rate, notably diminish after repeated charges and discharges. But this, Heim's experiments conclusively prove that it did not do.

Some of the author's chapters appeared as separate articles in the *Electrician* and other papers. Thus the paper Mr. Wade contributed to the *Electrician* on Edison's battery is incorporated bodily, with the exception of a passage, which at the time was criticised in the columns of this Journal. This has since been altered, though even as now presented it is not quite above criticism.

As regards the chapter on present day cells, we should have been glad to see a more critical attitude adopted. Mr. Wade seems to have gone round and amassed all the "information" which the manufacturers gave him, and put it straight into his book; though his remark that "the Leitner accumulators give up to 25 watt-hours per pound of complete cell" is obviously a printer's error. A little revision of the Index, too, might prove useful in the next edition, as likewise some explanation, for the benefit of amateurs, as to why certain impurities, either in acid, lead, or oxide, are injurious. Mr. Wade tells us how to detect them, and that they are bad things to have present, but not why this is so.

These, however, are all trifling imperfections, which can easily be remedied in the next edition of the work, and we have no hesitation in saying that even in spite of them it is the best, most generally useful, and most attractive work on the subject with which we have as yet become acquainted.

"Notes on the Management of the Gardner-Serpollet Steam Motor," by G. H. Olliver. Second edition. (Iliffe and Sons, Limited, London.)

This very handy little volume gives in succinct form really valuable instructions for the practical running of Gardner-Serpollet cars. It is not a description technical or otherwise of the system, but rather a very complete catalogue of all the things that may happen from the time of starting to get up steam till the end of a run, with some general reflections thrown in. In fact, it presupposes a general acquaintance with the mechanism, but that is about all it does presuppose, and, given that, the book would really enable anyone with reasonable intelligence and practice to drive a Serpollet—not so easy a job to get the best results with as it looks by the way when one sees it sailing majestically and noiselessly along. The work concludes with a number of practical questions, and anyone who can answer all of them has not much to learn about the system. The work has perhaps one fault, it gives the impression on superficial acquaintance that the Serpollet is a much worse monster to manage than, as a matter of fact, it is. But this impression is only superficial. Careful study of the book will remove it.

Referring to the new automobile law of New Jersey, which came into force on March 23rd, W. E. Scarritt, President of the A.C. of New Jersey, considers that it is the best and fairest automobile law in the United States, and has sent round to all New Jersey automobilists a strong letter urging respect for the provisions contained therein. We gave a brief outline of the Bill in our issue for March 28th. Under it every automobile owner has to register, and, if he wishes to drive, to file a duly verified declaration with the Secretary of State that he is competent to drive a motor vehicle, and, at the same time, deposit a brief description of the character of such motor vehicle, accompanied by a fee of $1. A licence is then issued, and it becomes obligatory to have upon the back of the car a number, the figures of which are 3 inches in height and the strokes of which are not less than ⅜-inch in width, visible during daylight and numbers upon the lamps not less than 1 inch in height, visible at night. Road racing is, of course, prohibited, police officers having the power to arrest without warrant for any violation of this rule. In drafting the Bill, which is really a modification of the Scovel Act, it is pointed out by Mr. Scarritt—who, by-the-bye, was the first to register himself under the new law—that the Legislature of New Jersey has proceeded upon the theory that automobilists are gentlemen and are observant not only of the statute law but of the moral law of courtesy, and he asks therefore all automobilists to live up to the standard laid down and help to stamp out the exception.

The purchase of a steam motor fire engine costing £1,050 is being considered by the Edinburgh municipal authorities.

On the front at Brighton, at a spot near the Metropole Hotel, on Easter Monday, 112 motor cars and 38 motor cycles were counted at one time.

For the purpose of facilitating their official work, the Police Commissioners of London have ordered from the Wolseley Motor Car Company two 10-h.p. cars of the wagonette type.

A far-away echo of the Oxford anniversary run last November appears in the current issue of the *Club Journal*, where it is notified that the car, "Weary Will," has been awarded a non-stop certificate. What's in a name, indeed?

About thirty cars attended the Inaugural Meet on Saturday last of the Norfolk Automobile and Launch Club at Yarmouth. An inaugural motor launch handicap has been fixed by the Club on Oulton Broad for August 20th next.

We have received from Mr. Moffat Ford the following clever parody on the well-known soliloquy in "Hamlet," adapted for motorists and their relations with the police:—

THE MOTORIST'S SOLILOQUY.

(*With apologies to the late Prince of Denmark.*)

To stop, or not to stop; that is the question:
Whether 'tis wiser for a guiltless driver
To halt, when ordered by officious sergeants,
Or to protect himself from future trouble
By just ignoring them? To halt; to tip;
No more. And by a tip to say we stop
That summons for exceeding legal speed
That flesh is heir to! 'Tis a consummation
Devoutly to be wished. To halt—to tip—
To tip—and *then* be fined! Ay, there's the rub;
For in a court of law there are imposed
Such awful penalties on motorists
That give us pause. There's the respect
That makes us anxious to observe the law,
For who would bear the tedious procedure—
The sergeant's tales, his witness's untruths,
The quips of rural Bench, the mis-read law,
The insolence of office, and the spurns
The patient motorist from reporters takes,
When he could easily prevent them all
With his top speed? Why, who would ever stand
The weird decisions of the Reigate Bench,
But that the dread of something worse than this—
The numbering scheme to label every car
And give the police more scope, puzzles the will,
And makes us rather bear those ills we have,
Than fly to others that we know not of?

It will be observed that the parody is arranged to form an argument against the numbering and identification of vehicles. We are afraid, however, that the ills which the clever parodist is anxious to avoid are worse than even he suggests, as we have already pointed out that they may consist not merely of numbering with the speed limit removed, but of numbering or identification without the removal of the speed limit. However, apart from this objection, no one can fail to admit that the parody is extremely happy, and certainly embodies most skilfully the frequent feelings of automobilists, particularly on Surrey roads.

Imports into this country, chiefly from France, of motor cars, motor cycles, and parts, for the first three months of this year, amounted to £468,143 as against £167,050 for the same period of 1902. During the same three months the corresponding exports amounted to £20,177.

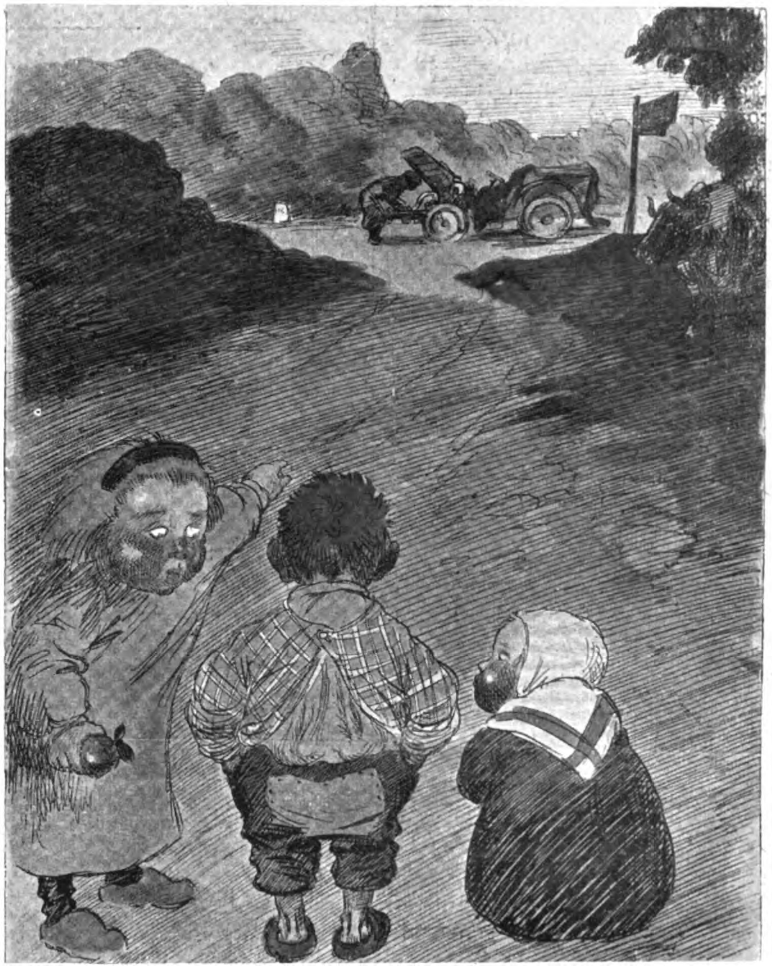
Preparatory to his receiving delivery of his new 10-h.p. Wolseley Car, which we mentioned some little time back was being built for him, Captain H.S.H. Prince Louis of Battenberg paid a visit to the Wolseley Works a few days ago, and was much interested in the various stages of motor car manufacture which he witnessed.

The St. Petersburg and the Moscow Automobile Clubs have joined hands with the object of controlling in the future, by affiliation, all other Russian automobile clubs.

A dividend of 50 per cent. has been declared for the year 1902, as against 45 per cent. for the previous year, by the Continental Caoutchouc and Gutta Percha Company of Hanover.

The New York Women's Automobile Club is in course of organisation in the United States. It is proposed that every member should own a motor car, and it is stated that the club will start with a membership of 100.

One thousand 2-seated voiturettes, by way of commencement, to be put on the market at a popular price, have been put in hand by Messrs. Vickers, Sons, and Maxim (Limited), at their Crayford Works in Kent. These are to be built on the well-known Wolseley lines, and will have two speeds forward and reverse, and weigh about 8 cwt. Delivery, it is expected, will be possible in about three months' time, and the manufacture of these cars will be under the supervision of Mr. H. Austin, General Manager of the Wolseley Tool and Motor Car Company (Limited), of Birmingham. The Adderley Park Works of this Company were already of very large extent, but this new departure will jointly constitute the largest works in the world devoted to the manufacture of motor vehicles.



(Drawn by G. Meunier.)

—Tiens, garde donc là bas, la gôsse bête qui mange le monsieur!

News comes to us from Brooklyn, in the United States, of a remarkable motor that has been invented by a Mr. O. P. Ostergren, of Brooklyn. If the accounts published are to be believed, Mr. Ostergren's engine must be a wonderful affair. It is a "2-cycle engine" (of course), uses ordinary heavy oil for fuel, and is said to give an increase of 50 per cent. h.p. The following piece of description is a gem:—"The oil is taken in at the top of the cylinder, vaporised, mixed with the proper amount of air, and its consumption is said to be only one half-pint of oil an hour for each horse power." The statement that the capital provided for a Corporation, entitled the Fuel Oil Power Company, to exploit the invention, with shares amounting to one million pounds sterling, is mainly English may be complimentary or the reverse to the British as a nation.

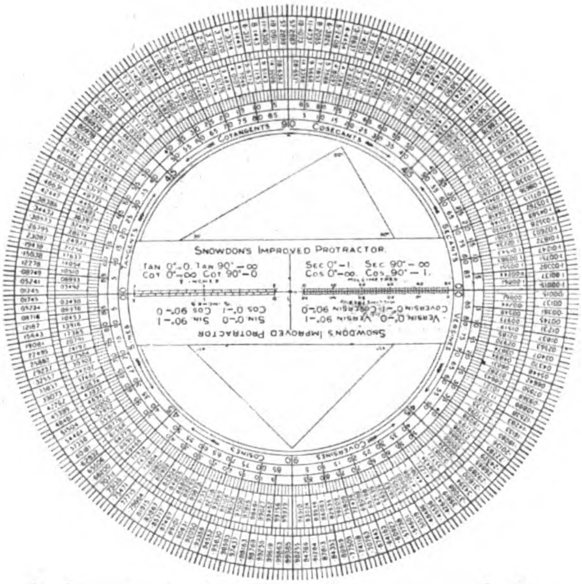
The Pacific Automobile is the title of a new monthly journal just started at Los Angeles, California.

With commendable promptitude the plan of the Society of Motor Manufacturers and Traders' Automobile Show for 1904, indicating the exact positions allotted to the various forms at the first ballot, has been issued. These include 35 firms out of a total of 78 exhibitors, taking a total of 50,000 square feet, who have signed a bond not to exhibit at any other motor show.

In spite of the speed being limited to seven miles an hour, British parents are hardly likely to attempt to lower the flag of Mr. Ogden, who is reported from America to have had built for his three and a half year old son a 1¼-h.p. motor car which the child operates himself.

A novel competition is announced by the French Automobile Club du Nord for tourist vehicles, open to members of the club only. The idea is for members to record during their runs all matters of interest and of value, from a tourist point of view. The time, the duration of their tour, and the route are optional to each member, subject to the excursions being made between April 1st and November 1st. The date of starting and return, and the daily stopping places, must be advised daily to the secretary of the club. A full written record of each journey has to be made, which it is suggested should include all matters of interest in connection with the roads, hotels, repairers, petrol stores, etc., which are met with *en route*, so that extremely valuable data of a practical nature should become available for members of the club. These records will be subsequently read before the club members, and a committee will decide upon the relative merits of the descriptions and data sent in by each competitor. Taking photographs is optional, but results in this respect will be taken into consideration by the Judges. It is significantly pointed out that a tour of 200 kiloms. thoroughly well recorded would be considered of greater merit than a 15 days' excursion indifferently recorded.

Everybody who has had to do trigonometrical calculations knows what a lot of trouble is involved in looking out in the mathematical tables the values of sines, cosines, tangents, etc. For approximate calculations in cases where differences involved are not greater than one degree, Mr. Snowdon's protractor is calculated to save everybody a great deal of time. As our illustration shows it is a table of sines, tangents, and cosines, versed sines, co-tangents, and cosecants arranged in circular form in two concentric rows, so that the value of the constants for any angle can be read off at sight.



Recognising the enormous advantages likely to accrue from the use of mechanical collecting vans, the Paris sanitary authorities are specially inviting makers of municipal motor vehicles to show what they can supply for this purpose to supersede, if possible, the horse-drawn sanitary carts now in use. Very full regulations have been issued embracing both horse-drawn and mechanically-operated vehicles. Those automobile makers who wish to obtain a footing in this direction, after applying to the Prefect of the Seine, at 9, Place de l'Hotel de-Ville, Paris, for the necessary form of entry for vehicles, amongst other things will have to state the price of their vehicle, and be prepared to construct 30 similar vehicles within six months after the vehicles are selected. Full drawings and all other particulars must be supplied, and the whole of the applications will be considered from a technical and a financial point of view, due regard being given to rapid service and solidity of construction, too much importance not being necessarily attached to prime cost. Vehicles provisionally selected by the Commission will be put into active service for a period of two months, the work being done by the regular employees of the Municipality, assisted, if desired, by a representative of the makers of the vehicles. A guarantee must be given of the minimum consumption of fuel or electric current per hour for a regular speed of 12 kilometres per hour.

DOINGS OF PUBLIC COMPANIES.

The British Power Traction and Lighting Company (Limited).—At the Board of Trade offices last week, the Official Receiver's report was presented, and stated that this Company was registered on September 15th, 1900, with a nominal capital of £52,000, divided into 50,000 preference and 2,000 ordinary shares of £1 each, and was formed to take over as going concerns five businesses, in each of which Mr. A. E. Hodgson was interested. The total price to be paid by the Company was originally fixed at £58,768, but was afterwards reduced to £57,282. The business, which was carried on at York, consisted mainly of the manufacture of motor cars, for which a large number of orders appear to have been booked. Difficulties were encountered from not having the cars ready for delivery, in training the local workmen in a new industry, and from want of working capital. The motor cars manufactured by the Company were on the Gardner-Serpollet principle. The statement of affairs shows a total indebtedness of £67,403 14*s*. 8*d*., of which £28,906 16*s*. 1*d*. is returned as unsecured, and no available assets, the whole of the amount (£37,548 8*s*. 11*d*.) being required to meet claims on debenture bonds. As regards the shareholders, a total deficiency of £77,955 16*s*. 1*d*. is disclosed. The claims of the unsecured creditors are stated to be almost entirely for goods supplied and advertising. The Official Receiver (Mr. H. Brougham) has been entrusted with the conduct of the liquidation, a committee of inspection being also appointed.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Industrial Storage Battery Syndicate (Limited), 4, Corbet Court, Gracechurch Street, E.C.—Capital, £100,000 in £1 shares. Object, to acquire British Patent No. 9,187 of 1901, relating to improvements in electrical accumulators and to adopt an agreement with C. P. Elieson and V. de Bolinsky. The first directors are C. P. Elieson and A. J. Faulding.

Lycett Saddle and Motor Accessories Company (Limited).—Capital, £10,000 in £1 shares (5,000 six per cent. cumulative preference).

Tubes-Bizet Parent Syndicate (Limited), 1, America Square, E.C.—Capital, £15,000 in £1 shares. Object, to acquire patents conferring the right to use cylinders for containing compressed gases, reducing valves for the same, and machinery for filling such cylinders and otherwise, and to acquire certain inventions of J. B. Bourseau and J. Bizet, and to carry on the business of manufacturers of compressed gases and apparatus relating thereto, manufacturers of and dealers in motors, cycles, &c. The first directors are M. Lumley and A. C. Collins.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published April 23rd, 1903.

43. W. H. Waud. Transmission gear.
7,800. E. S. Toomer. Construction of machinery so as to avoid the use of a crank in obtaining rotary motion.
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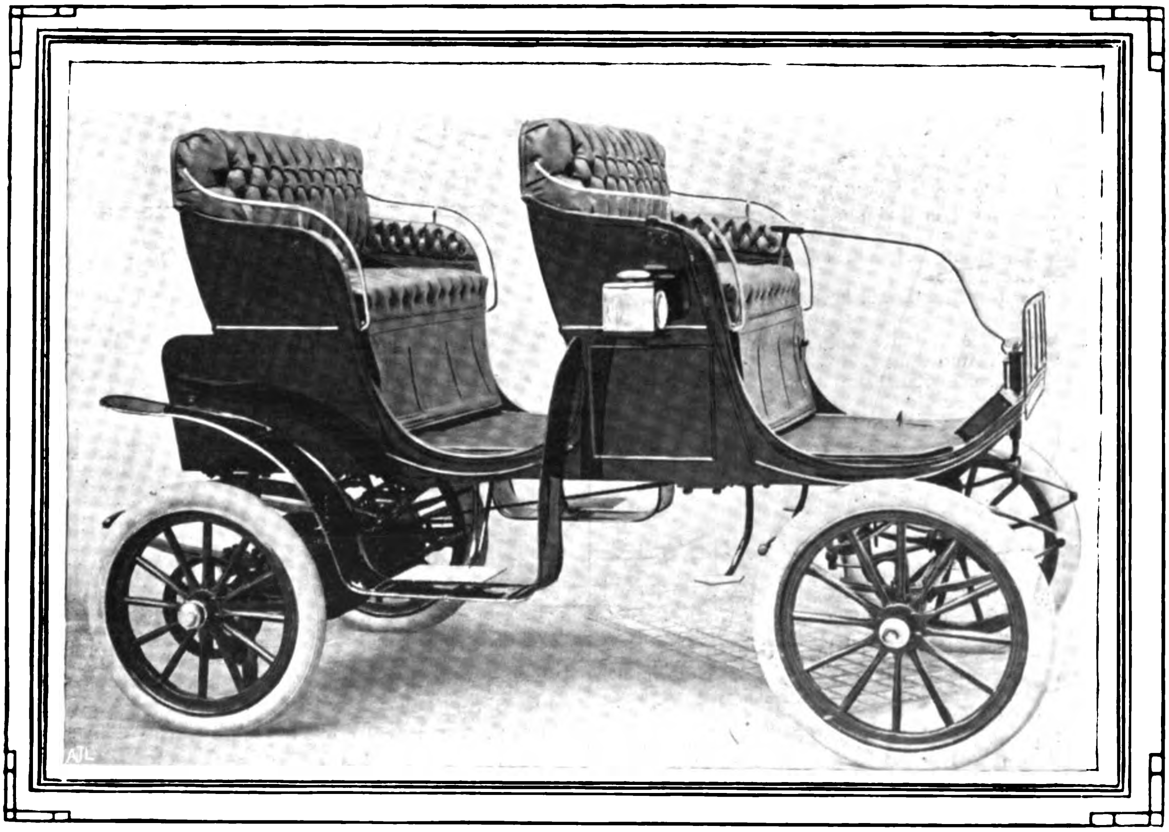

A SIX H.P. WAVERLEY ELECTRIC SURREY (*see page* 419).

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
*April 24...		... Quarterly 100 Miles Trial.
April 25...		... Eliminating Trial Gordon-Bennett Race.
April 27, May 4, 11, 18		"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14		... Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
May 16 ...		... Sheffield A.C. Hill Climb, Padley Wood.
May 23 ...		... Scottish Auto Club Hill Climb.
*June 13 ...		... Gymkhana at Ranelagh.
June 20 ...		... Manchester Auto Club Hill Climb.
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park.
July 6 ..		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy.
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork. Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
July 24-25		... Southport Speed Trials.
*August ...		... Tourist Motor Bicycle Reliability Trial.
*September		... The 1,000 Miles Trial.
1904.		
		... *Light Van Trials.
*Feb. 12-24		... Crystal Palace Exhibition.

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
May 9-14 ...	Belgian National "Circuit."
May 14	Paris-Madrid. Start of Tourist Section.
May 16-24 ...	Stockholm Exhibition.
May 18	Speed kilom.—Geneva (Swiss A. C.).
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May 25-30 ...	Hanover Alcohol Van Trials (German Agricultural Society).
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-28 ...	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21 ...	Circuit des Ardennes.
June 28	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16 ...	Race Trelex-Saint-Cergves (Swiss A. C.).
Sep. 6-13 ...	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September ...	Udine Exhibition (Italy).
Oct. 15-21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to The Editor of "The Automotor Journal," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

A QUESTION OF SPORT.

Some strong comments have been made in the daily Press in regard to the controversy which is at present raging concerning the admission of Lieut. Mansfield Smith-Cumming and his Wolseley car to the Eliminating Competition for the third place in the Gordon-Bennett. The Star Company, who have entered a car and paid their £500 caution money naturally object to the entry of a competitor who did not announce himself at the prescribed time, and to a large extent the Company is, no doubt, justified in its protest. To win, or even successfully run a car in the Gordon-Bennett Race, will doubtless prove a valuable trade asset for the fortunate firm which has constructed it. But that is not the only aspect of the case. The main object that every automobilist in this country should have in view is that the Cup should be secured by a British competitor. If the Wolseley car now owned by Lieut. Cumming is clearly a better car than the others competing in the Eliminating Race, it would be a great pity that it should be excluded from the Gordon-Bennett contest. It means giving one more chance to the foreigners. From the individualistic trade standpoint we can fully appreciate the opposition to admitting Lieut. Cumming, but from the sporting point of view the question has a different appearance. Even from the purely industrial point of view it is of the greatest importance that an English car should win—of much greater importance than that any particular English car should merely have a chance. In addition it must be remembered that Lieut. Cumming was not the possessor of the car at the time when it was necessary to make the entries, though we understand there is no question about his willingness to pay the caution money. Perhaps the Club and the already entered competitors would be stretching a point in admitting him, but they would be stretching a point on behalf of a national industry, and would be acting from a truly sportsmanlike point of view.

◆

A COMPETITOR WITH THE CAMEL.

WE have previously referred to the success which has already been gained in adapting motor vehicles, particularly of the steam lurry type, to the navigation of sandy deserts and particularly the Sahara. The first difficulties, of course, were experienced in so constructing the wheels of these vehicles as to enable them to traverse the sand without sinking to an unmanageable depth in it. Messrs. Jesse Ellis and Co., the well-known steam lurry manufacturers of Maidstone, in conjunction with Lieut. Winter, have recently devised a type of wheel which it appears is successful in overcoming all the difficulties. The lurries, to which we previously drew attention, were satisfactory on moderately hard sand, and were provided with wheels resembling those of an ordinary traction engine, though somewhat broader with the cross-ribs taking up only a portion of the surface of the wheel. These lurries were successful, as we have already chronicled, in conveying some 40 men each over considerable tracts of desert sand, but occasions arose when softer sand was encountered, that wheels of this type were found inadequate. The new wheel adopted by Messrs. Ellis and Winter is of a lighter type than the former and is provided with double flanges. These cut into the soft sand to a certain depth and prevent the sand under the tread of the wheel from slipping away. A good grip is obtained and the difficulty is got over. All the desert wagons made by the firm are now provided with two sets of wheels, one set for relatively hard sand and the new wheels for encountering soft sand. They can be readily changed when the latter is encountered and the journey successfully concluded.

◆

OILING ROADS.

As far as the experiments conducted in this country have gone the immediate approach of a millennium of dustless roads for automobilists can scarcely be anticipated just at present. We understand, however, that the inhabitants of California are disposed to smile over the comparative failure of our experiments, as they are accustomed, in spite of their hot and dry climate, to roads rendered permanently dustless by the use of crude oil all the year round. Some of the critics attribute the superior results obtained in California to the use of Californian oil, which it is maintained has an asphalte base, whereas the crude Texas oil, employed at any rate in the case of the experiment at Farnborough, is an oil with a paraffin base. We do not think, with all respect, that this contention amounts to much because, though the residue obtained from distilling the different crude oils may be chemically different, they all leave as a residuum a pitchy or asphalte-like substance. We are more disposed to attribute the success obtained in California to the dryness of the climate, to the more frequent applications of the oil, and to the scientific manner in which it is put on. The Hampshire road was only subjected to one treatment, and after that came the wet weather and disintegrating frosts of winter. Had it been before the winter weather treated several times the oil would probably have penetrated sufficiently far into the road surface to render it proof against the destructive action of frost. There may also be a good deal in the manner in which the oil is applied. In California till recently it has been applied at a high temperature. This, of course, facilitates the penetration of the oil to a much greater depth into the road surface, and special machines have been built in California for thus supplying the oil. In Hampshire, it will be remembered, it was put on with common water-cans and was not heated. Many Californian roads have been treated for a considerable length of time, and they have now become so impregnated that in many cases the heating can be dispensed with, but we do not believe that the comparative failure of the Hampshire experiments shows that oil cannot be satisfactorily employed for the purpose in this country. There is no purpose for which oil is employed in which it is successful unless used in sufficient quantity and sufficiently often. The greater "body" possessed by tar seems to render its effects more permanent where only one application of either has been tried. Comparative experiments of this kind were made last September in the neighbourhood of Nice, some portions of the roads being coated with oil and others with tar. These roads were inspected by the Automobile Club of Nice recently, when it was found that all signs of the petroleum had disappeared, while the tarred portions were still in excellent condition.

◆

A CENTRAL AUTHORITY FOR LONDON TRAFFIC.

WE do not know what the ultimate result of the deliberations of the Committee which is at present sitting with a view to introducing something to increase the facilities of getting about the Metropolis may be, but interesting points continue to be raised by the various witnesses who are examined before it. One of the most important recommendations yet made was that by Mr. A. C. Morton, who is chairman of the Streets Committee of the Corporation, and represents the views generally of the Corporation on the problem before the Commission. Mr. Morton proposes that a special authority should be constituted for dealing with all railway, tramway, and other traffic schemes before they are submitted to Parliament, that is to say the proposed Board would have to pass such schemes before they are open to private opposition. This will certainly tend to diminish the enormous expenditure involved both in promoting, and what is of perhaps more importance to the automobile public, opposing such schemes. The expenses to which the city has been put in recent years in opposing tramway schemes which would have had the effect of largely rendering unsightly the best thoroughfares of London has been enormous. Automobilists will be thankful for the introduction of any arrangement which facilitates opposition to schemes to which both they and the majority of Londoners are opposed, which have been brought forward time after time in spite of the declared opposition of the community generally, and whose promoters seem merely anxious to wear down opposition possibly by exhausting the funds of their opponents. Mr. Morton's suggestion, if carried into effect, would tend to discount these tactics.

LEGISLATION AND NUMBERING.

We have pointed out from time to time that the tactics of those automobilists who are opposed to any concession in regard to numbering or identification of vehicles are, in our opinion, mistaken, and that they may ultimately lead to the very undesirable result of the industry being saddled with the necessity of carrying numbers without any corresponding alleviation of the speed limit. Those who so blithely ran off on what we consider a false scent on the numbering question may perhaps not have noticed a recent change in the tactics of the Metropolitan police. Hitherto they have distinguished themselves very favourably in comparison with the police in the country by consideration and common sense. Recently, however, a change has come over their behaviour, and it has frequently been observed that a constable will pounce with much unexpectedness and vigour upon passing motor vehicles. It has also been noticed at the same time that they make no very strenuous attempts to stop them, but are on the contrary, almost relieved when they escape, whereupon they become absorbed for a time with their note-books, which as we all know are a very favoured weapon of theirs. Can it be that an order has gone forth to collect statistics relative to the number of cars which the police are unable to stop and identify at present? If so, it is not the best of omens as regards the legislative prospect.

PRACTICAL ASPECTS OF PATENT QUESTIONS.

In our present number we renew the series of articles in which we dealt with those aspects of patent questions and patent law which are of interest to manufacturers and commercial men generally. In the first series (Vol. VII., Nos. 77, 82, 83, 85) we discussed the best methods of dealing with and exploiting patents commercially, and the methods by means of which the possession of patent rights may sometimes be used as a lever to obtain advantages or concessions which the mere intrinsic value of the patent itself would not confer. In the present series of articles we propose to deal with the action of infringement, the revocation of patents, and the making of agreements and assignments in regard to licences and patent rights. These subjects will be treated on the same general lines as adopted in the previous series. That is to say, the strictly legal and technical aspects of the questions discussed will not be prominent, and the advice tendered will often be of a quite unconventional character. The object aimed at is to be of use to any of our readers who may become concerned with patents commercially. It is not always easy to get strictly disinterested advice, either from law books or those who write them.

A MOTOR RACE COURSE—AN INSPIRITING PROSPECT.

We alluded, while the scheme was still in the nebulous condition, to the possibility that before long the automobile public might have the satisfaction of seeing the construction and organisation of a satisfactory automobile race course in the near neighbourhood of London. We are glad to be able now to announce that the project is no longer nebulous but has condensed into a practical scheme of a most satisfactory kind. A position has been secured in the neighbourhood of Purley, at a distance of only about 14 miles from Charing Cross, and on this site a very up-to-date track—within reach of three stations—will soon be in course of construction. The country near Purley, as everybody knows, is undulating, and the course will be far from flat, although there is a length of upwards of a kilometre on the dead flat which will enable English automobilists to make their own records for the flying and standing kilometre. But an undulating course is the best calculated to bring out the qualities of both cars and drivers, and Mr. Edge, who has surveyed the ground over which it is proposed to construct it, is of opinion that it is admirably suited for its purpose. The track will not be a complete circuit. There will be two long straight laps with loops, and the whole distance round the course will amount to seven miles, the width varying from 50 feet to 70 feet. The hills available vary in gradient from 1 in 20 to 1 in 7, one of them being a mile and a quarter in length, so that hill climbing tests of a satisfactory character can also be carried out. The Automobile Club has arranged to have the right to organise race meetings on the Purley track for 40 days in any year, and also to be able to hold a big meeting of six consecutive days right off. There is every reason to believe that an automobile Derby, in the neighbourhood of London, would soon become as popular as the equine Derby at Epsom, and that the gate money likely to be collected would be sufficient in amount to furnish a useful fund for supporting the sporting aspects of automobilism.

ELECTRIC VEHICLES AND THEIR TREATMENT.

Very noticeable during the past year is the great increase which has taken place in the use of the electromobile for town purposes. Not only have the existing businesses, which have for a long time past done so much to popularise electric vehicles in London, undergone very great extension, but a considerable number of new businesses have also sprung up which are being conducted more or less on the lines which the pioneers in this particular form of locomotion have proved to meet the requirements of the public. We deal at length in our present issue with a new type of electric vehicle which is being introduced into this country, and is calculated to still further popularise the electromobile in towns. There is no doubt that the coming year will see light electric vehicles considerably more popular in London than they have been in the past. Amateurs, however, are likely to be misled by the extreme simplicity of manipulating an electric vehicle into neglecting its most vulnerable part—the battery. We refer elsewhere to articles in which we have, in the past, dealt with the necessity of affording accumulators in electric vehicles fair play. We intend at an early date, in view of what we believe to be the approaching considerable increase in the popularity of this type of locomotion, to deal with the same subject again, and particularly from the point of view of the amateur.

THE WAVERLEY ELECTROMOBILES.

As already announced by us, the Locomobile Company of Great Britain have recently taken up the sale of the light electric vehicles which are known as the Waverley, and are manufactured in America by the International Motor Car Company of Indianapolis. An attractive assortment of these little cars was first shown in this country at the recent Exhibition at the Agricultural Hall, where their neatness of construction, excellence of finish, and remarkably low cost caused them to attract a considerable amount of attention from the visitors.

Many of our readers may have felt some surprise that a company who have done and are still doing such a large business with their light steam vehicles should have taken up what at first sight appears to be a competitive type of carriage. Upon further reflection, however, it will be realised that the step taken by the company can only add to their commercial reputation for enterprise and astuteness and that there is a very distinct field open for the little electromobiles which they are now offering to the public.

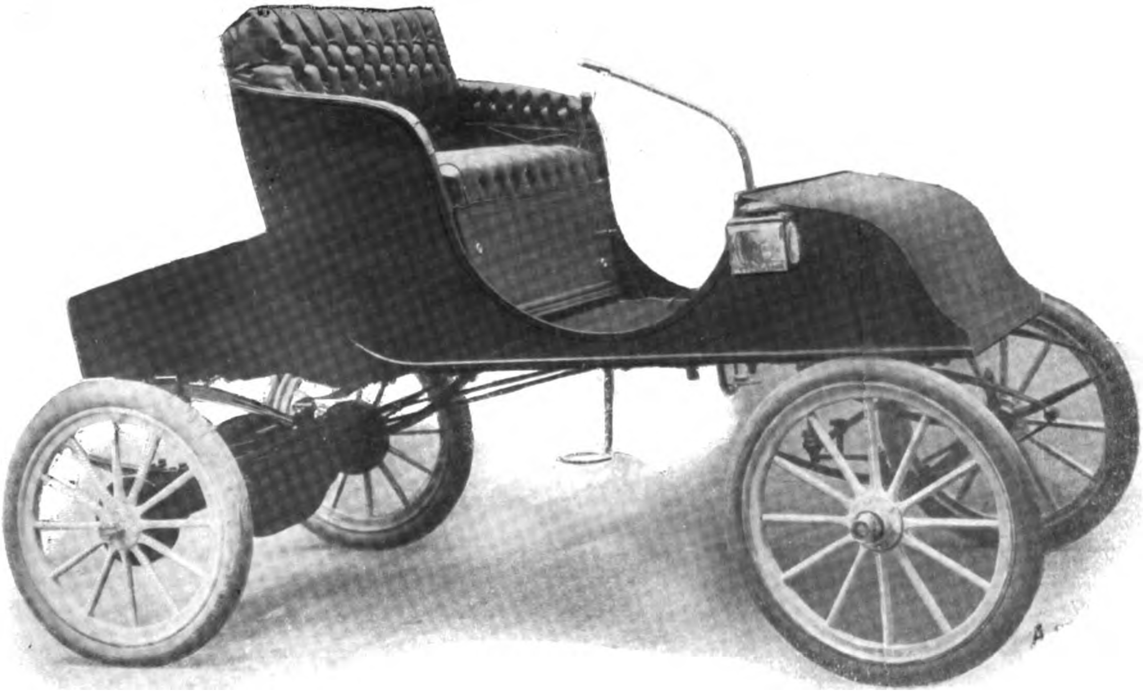


Fig. 1.—The Waverley "Chelsea" Car.

It is very generally recognised that the advantages possessed by electromobiles over any other form of self-propelled car render them essentially *the* vehicle for short distance work, and for use particularly in large towns. Their management, moreover, is so simple that a large number of people living in the neighbourhood of a great city would only be too willing to avail themselves of such cars, even if their prejudice against automobiles generally, or their disinclination to exert themselves sufficiently to master any other form of automobile, were to stand in their way and prevent them from availing themselves of the benefits of the new form of locomotion. Hitherto the majority of electric vehicles running in London have been constructed with the object of providing those who can afford it the luxury of an electric carriage in which they can be driven about from place to place, and the popularity of such cars as these has recently increased with a rapidity which must have been surprising to many. Comparatively few electromobiles, however, of the light "run-about" type, intended to be driven by the owner, have hitherto made their appearance, although it is difficult to conceive that a man who has the means to purchase such a machine should forego the undoubted pleasure which is to be experienced by driving it personally.

We have constantly referred to the one bugbear which is more or less common to all electric vehicles, and our readers are well aware that the battery question is alone responsible for the non-success of many of such cars in the past. The battery difficulty, however, has been entirely overcome so far as the London user is concerned, owing to the enterprise of those companies who have laid themselves out to give continual attention to their customers' vehicles, and to ensure a reasonably long life to the batteries by giving them just that expert observation which is necessary in order to make all the difference to them between being a failure on the one hand or a thorough success on the other.

The Waverley vehicles are made both for pleasure purposes and also for the use of tradesmen, but both classes of cars are of considerably lighter build than those which

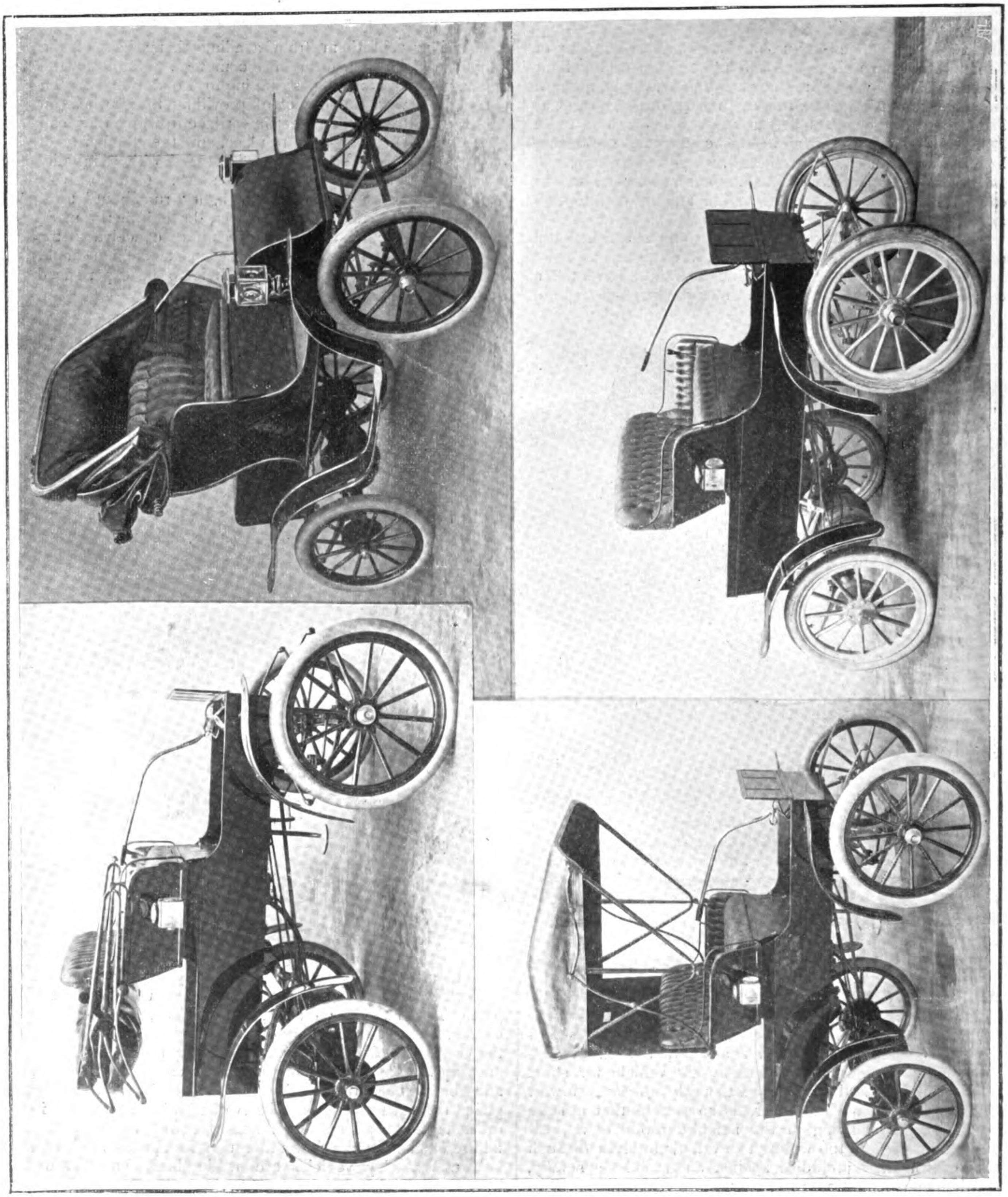


Fig. 2.—A Runabout with Hood folded down.
Fig. 4.—A Runabout with Hood up.

Fig. 3.—A Stanhope Car.
Fig. 5.—A Runabout without Hood.

Some 3-H.P. Waverley Electrobile Models.

are usually seen running either in this country or on the Continent. The private carriages are constructed either for two or for four passengers, and they are essentially intended to be driven by the owner. The Locomobile Company have not only found in the course of their ordinary business that there is a great demand in the Kensington district for such vehicles as these, but they are also fully aware of the importance of providing means by which they can continue to give the necessary skilled attention to their customers' vehicles. Their extensive premises, which we referred to and illustrated recently, are particularly well situated for the purpose, and they have now equipped a portion of the driving school so that it forms a very complete charging station. Their customers in the neighbourhood will be able to use the Company's garage and to get their batteries recharged without any trouble to themselves; they will, therefore, have the satisfaction of knowing that the cells are being well cared for in the hands of those who are thoroughly acquainted with their best management.

The Waverley cars are made in several types, the small ones having one motor, and a pair being fitted to the larger vehicles. The general appearance of some of these are shown in our frontispiece and in Figs. 1 to 6. They range in price from 190 guineas upwards, and although of light construction, as we have already said, and of neat appearance, as will be seen, they are strongly built and well-finished throughout. The most noticeable features and those which distinguish them from other electromobiles are found in the method of suspension adopted, in the type of motor employed, in the construction of the back axle and its connection through helical gearing with the motor, and in the controlling switches which regulate the speed and the direction of travel, besides affording an electrical brake.

The means provided for enabling the driver to control the car are shown in Fig. 7, where it will be noticed that the steering is effected by a tiller, A. The handle of the tiller is provided with a push-button, A^{1}, which is connected with an electric gong placed beneath the car. The speed is regulated by the lever, B, lying alongside the driver; it is shown in its top speed position in the illustration. The lever has three positions forward of the neutral notch, and when forced backward beyond the zero position, against the action of a spring, it produces an electric braking effect.

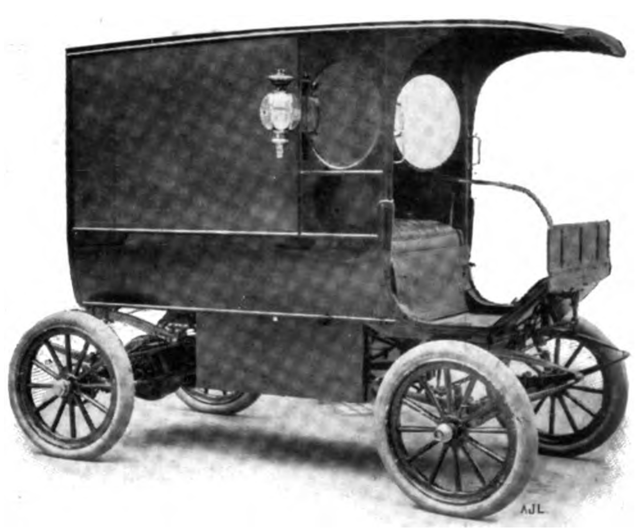


Fig. 6.—6-h.p. Waverley Delivery Van.

The direction of travel can be changed by the reversing lever, C, which projects forward beneath the seat. The foot-pedal, D, applies the side brakes, and is intended for ordinary use in traffic. The other pedal, E, actuates a band-brake on the motor-shaft, and, as it is extremely powerful, would be employed only in case of emergency.

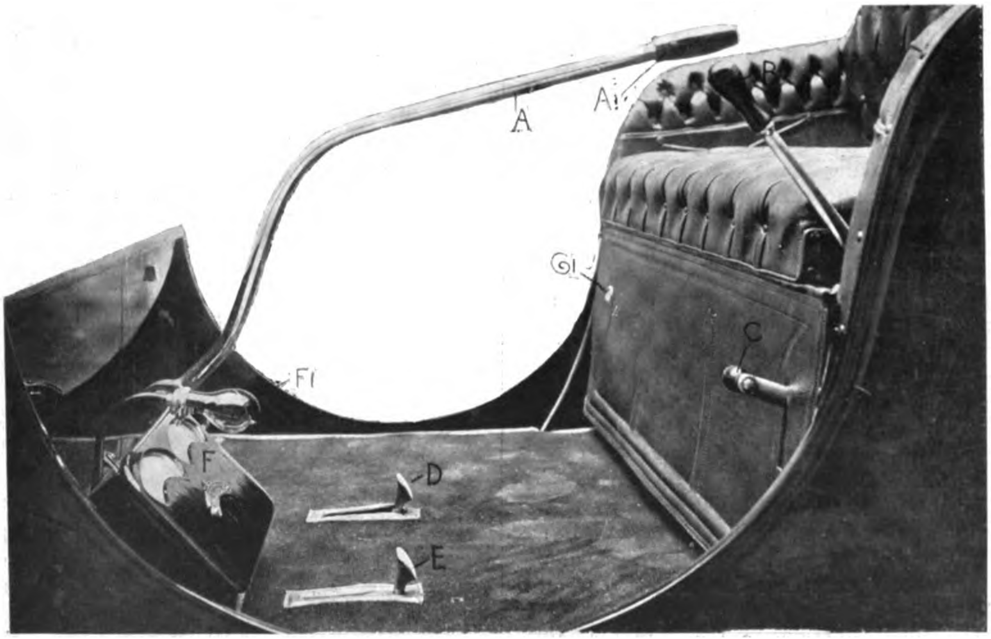


Fig. 7.—View showing Controlling Levers and Pedals and Electric Instruments.

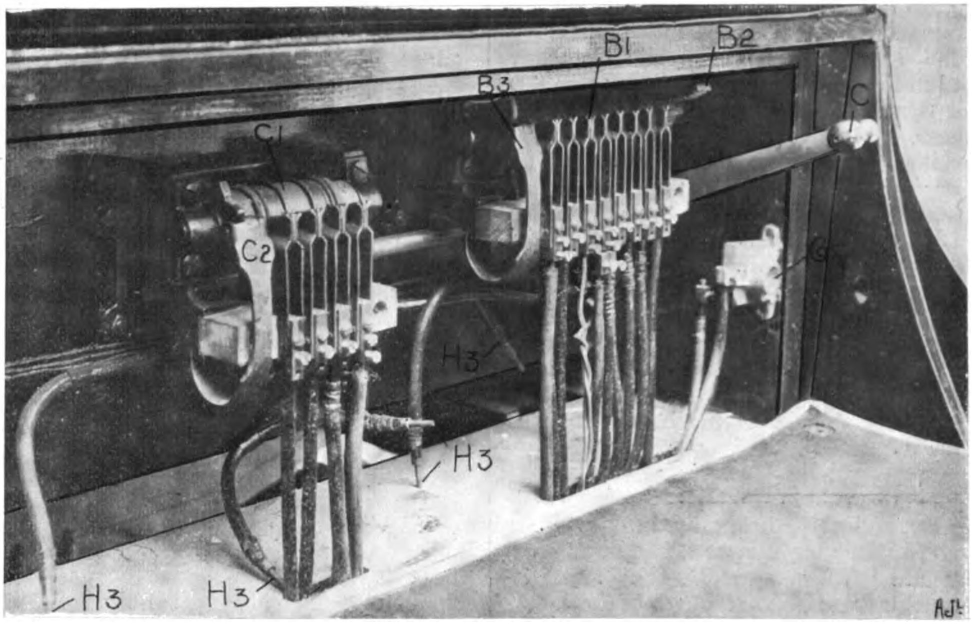


FIG. 8.—View of Controllers and Safety Plug.

A combined ammeter and voltmeter, F, is fixed on the footboard, in full view of the driver. The readings of the two instruments can be seen at night by switching on the shaded electric lamp, F^1, which is fitted immediately above it. This lamp is turned on by means of a small switch concealed beneath the carpet, and operated by the driver's foot. The carriage lamps are electric, and a separate switch, G^1, is provided for them. The only controlling fitting which is not seen in Fig. 7 consists of a safety plug and socket which is fixed beneath the reversing lever, C. The socket, G, is visible in Fig. 8, which is a view of the "speed" and "reverse" controllers in place beneath the seat, the front board which usually covers them having been removed.

The main controller drum, B^1, is connected with the hand-lever, B, through a toothed quadrant, B^2, and a pinion. The drum is thus caused to rotate and it is held positively in any of its working positions by a spring catch, B^3, which engages with a cam-plate fixed to the drum. The contact pieces on the drum make the necessary connections for the three speeds and for the electric brake. The cam is so shaped that it is impossible for the driver to leave the controller in its "braking" position, because the spring catch, B^3, tends to force the drum back to its neutral position. The reversing controller-drum, C^1, is operated from the hand-lever, C, in a very similar manner. It is held either in its "forward" or its "backward" position by the spring-catch, C^2. The wires connecting the controllers with the batteries, and with the motor, as also the type of stationary contact which is employed for the controllers, are clearly seen in the illustration. The ends of the wires, H^3, fit into terminals which are provided for them in the boxes containing the battery. These wires connect the whole battery in series and complete the circuit between it and the controllers.

In the two-seated vehicles having a single motor equipment (from which our photographs showing the construction were taken) the battery cells are fitted into three separate cases, H. Two of these are seen in Fig. 9, one having been entirely removed, and another of them being partly slid out. The boxes, H, are provided with plates having holes, H^1, in them; the holes enable detachable handles, H^2, to be employed for lifting the boxes in and out of the car. The terminals are fitted on the forward ends of the boxes, H, and these lie handy for connection with the wires, H^3 (seen in Fig. 8), when the battery is in place. For removing the batteries the tail-board of the car hinges down, and that portion of the body which covers them behind the seat, is also removable.

The ordinary equipment for the single motor vehicles consists of twenty-four cells; they are of the Exide type, and have nine plates in each cell. The capacity is approximately 110 ampere hours at a 30 ampere rate of discharge. In the double motor equipment forty cells of identically the same size are employed, and the two motors are precisely the same as those used on the smaller cars.

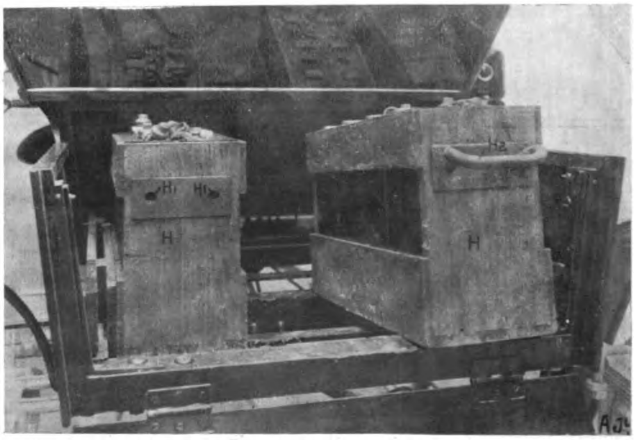


FIG. 9.—View from the rear of Car, showing position of Battery.

Fig. 10, which is a view of one of the small vehicles from beneath, shows the general construction adopted by the makers and the arrangement of the various parts. The main frame of the car is, for the most part, built of wood, and is stiffened with channel steel cross-members where necessary. It is supported upon full elliptic side springs above both the axles, and it should be specially noted that a transverse spring, K, which is carried in a cross-channel, K^1, connects the forward ends of the rear springs together through shackles. This arrangement is more clearly shown in Fig. 11, and is a very important feature of the Waverley cars. The spring, K, is of the leaf variety, and is fixed at its centre. It allows the back axle to rock over a certain distance in the one direction or the other, as the drive of the motor tends to make it do so. When starting the car either forward or backwards, the action of this spring is seen to a remarkable degree.

The back axle itself is of unusually substantial design. It is of the live type, with an enclosed differential gear, of the bevel-wheel pattern, arranged centrally upon it. The two halves of the revolving axle are enclosed, with ball-bearings, in the tubes, L^1, and the casing, L, is additionally stayed to the ends of the tubes, L^1, by the double, diagonal, tubes, L^2. The axle may therefore be regarded as being formed of three substantial tubes, converging from its ends and connected together by the differential gear case. The axle runs on ball bearings and in an oil bath.

The front axle is tubular and the front wheels are provided with ball bearings. The cones for these bearings are made with working faces on both sides, and are therefore reversible, so that when the one face is worn the cone can be turned round and the other face employed. The steering-heads turn in plain bearings, but a ball thrust bearing takes the weight of the car upon them. The front springs are not fixed horizontally, but their front ends are set about 1½ in. to 2 in. higher than their rear ends.

The motor, M, which will be described in detail presently, is bolted by a flanged coupling to the casing surrounding the differential gear. The casing is so shaped that the pinion on the motor-shaft (which meshes with the gear-wheel on the differential shell) is completely enclosed and that the motor-shaft projects through it to carry a brake drum, E^3, on its extreme end. This flange-coupling forms the only means for fixing the motor.

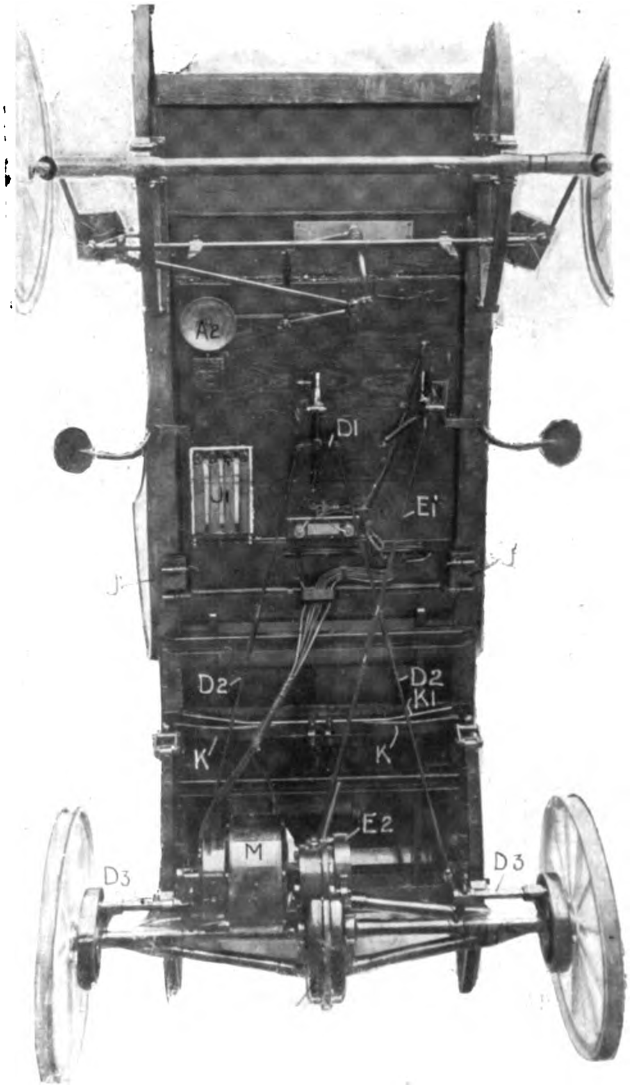


Fig. 10.—View of 3-h.p. Car from beneath.

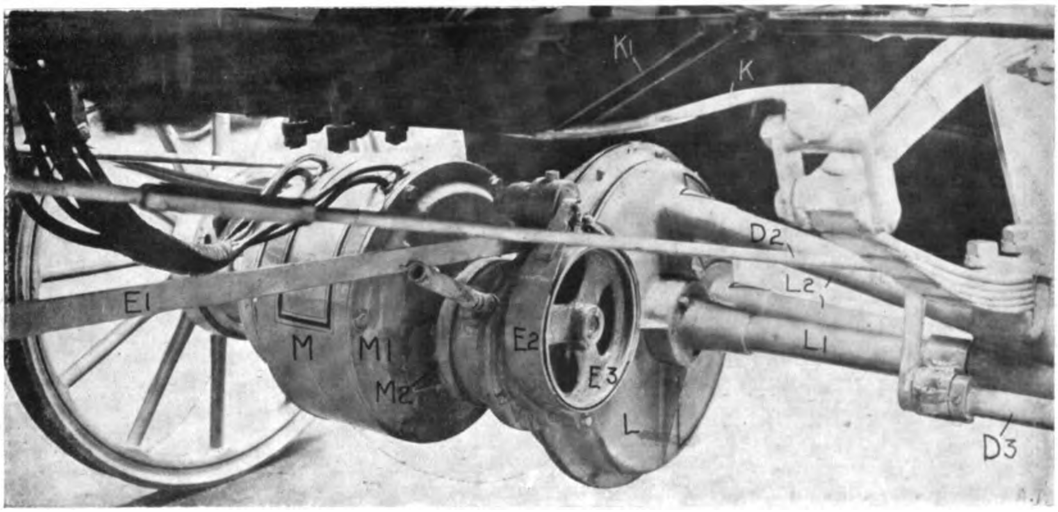


Fig. 11.—View of Motor in position in front of rear axle, also showing transverse spring, K.

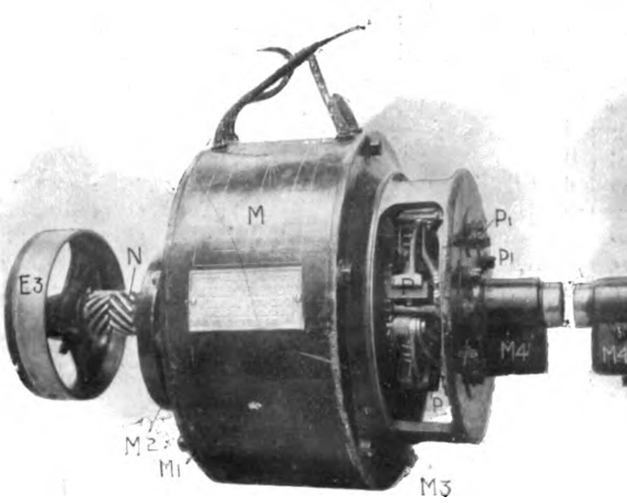


FIG. 12.—The Motor with Inspection-Ring covering the Brushes removed.

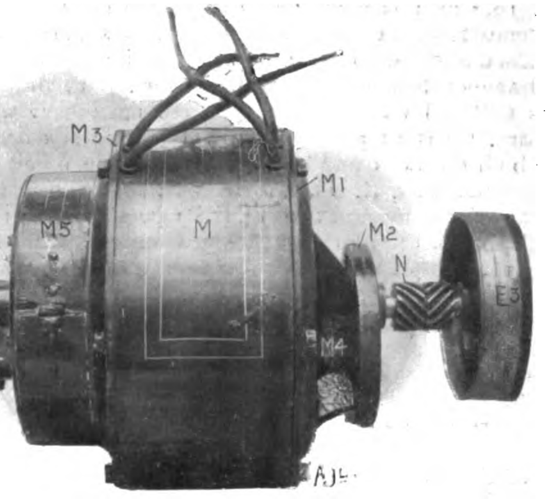


FIG. 13.—The Motor complete.

The arrangement of the brake-rods and of the brakes is clearly shown in Fig. 10. The rods, D^2, which apply the side brakes are compensated by the swinging lever, D^1, and the brakes themselves are of the metal to metal internal expanding type, in which the rocking shafts, D^3, force the brake-blocks outwardly against the inner faces of the drums. The brake-band, E^2, on the motor-shaft is operated from the foot-pedal, E (Fig. 7) through the rod, E^1 (Fig. 10). The electric bell, A^2, is also seen, and a resistance coil, J^1, which we shall refer to again presently, is conspicuous. We would also draw attention to the charging plugs, J, which are provided on both sides of the car; they enable the cells to be connected to any convenient source of electrical energy for recharging, without removing them from the car.

The complete motor is shown in Fig. 13. It is capable of giving a normal output of 3 h.p., although this can be considerably exceeded for short periods. The manner of gaining access to the brushes, as also its construction, are rendered clear in Figs. 12 and 14. The field magnets, M, which are circular, have six inwardly projecting poles, each of which is surrounded by a winding, Q. One pair of wires is connected with three adjacent coils, Q, in series,

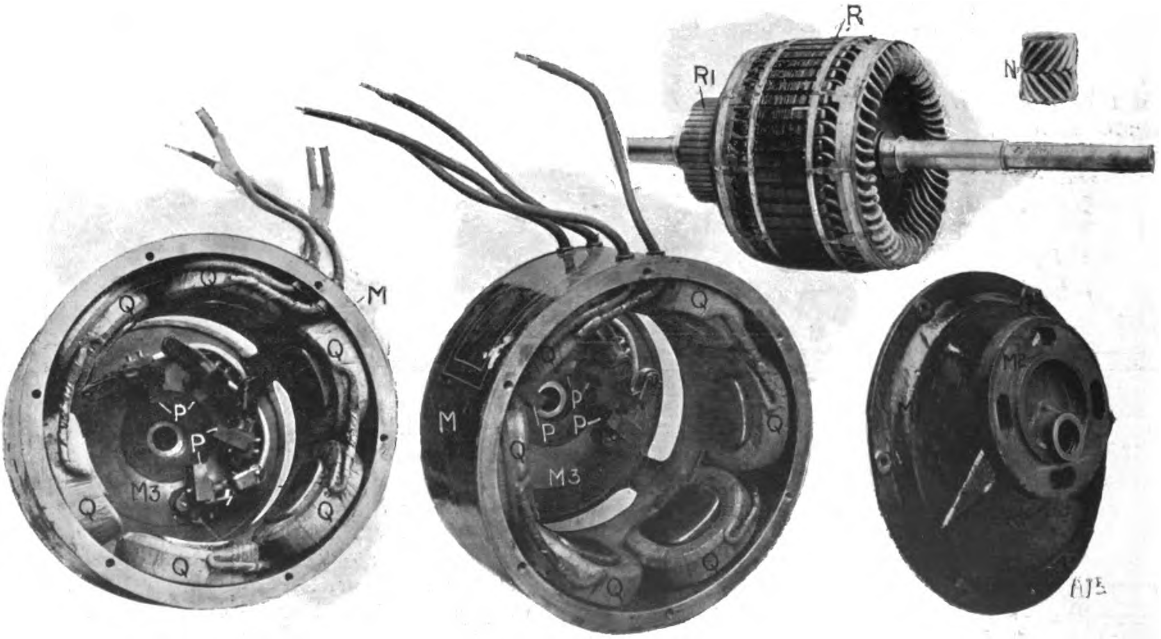


FIG. 14.—Views of the Field-Magnets (showing the Brushes) of the Armature, of the Helical Pinion, and of the Cover-Plate, M^1.

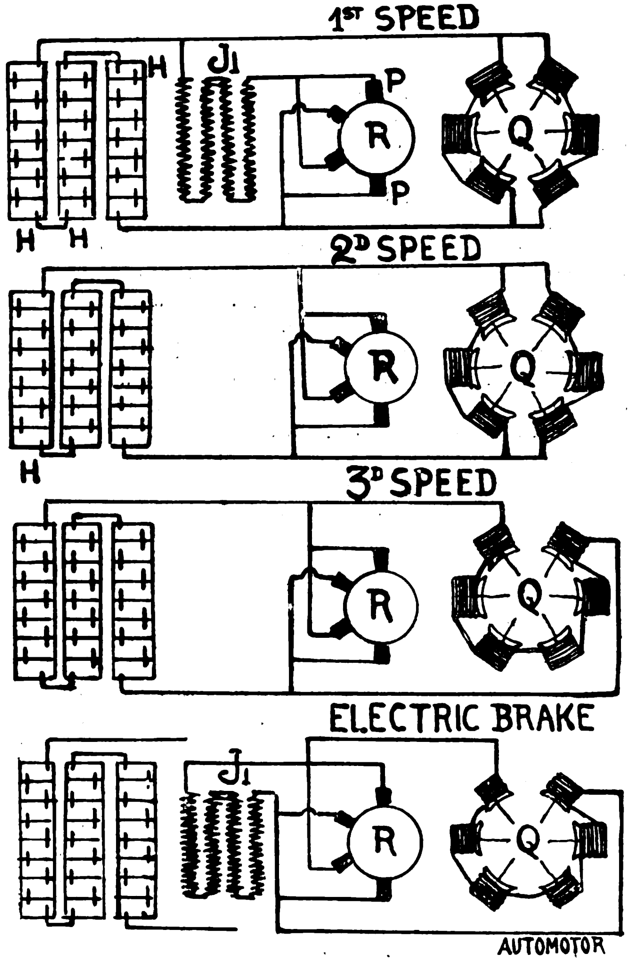


FIG. 15.—Diagram of Electrical Connections made by Change-speed and Brakeing Controller.

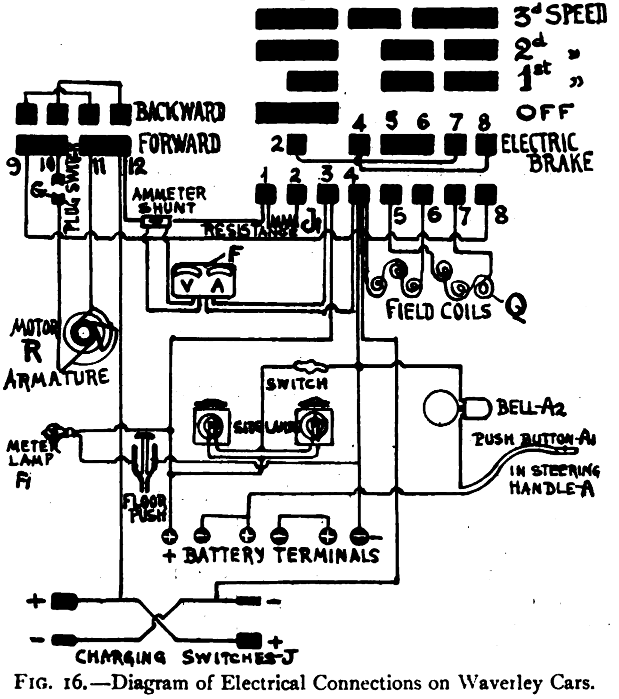


FIG. 16.—Diagram of Electrical Connections on Waverley Cars.

and another pair with the other three, also in series. The bearings, which are of the ring lubricated type, are provided by end castings, M^1, and M^3, which are bolted to the field magnet portion, M, in the manner shown. The casting, M^1, has the flange, M^2, formed upon it for bolting the motor to the rear axle. This flange is eccentric to the armature shaft; since the holes in it (through which the holding bolts pass) are slotted, the gear wheel on the shaft can be adjusted into mesh with the wheel it drives, by sliding the flange round about its axis. The other casting, M^3, encloses the commutator, R^1, and the brushes, P, the latter being fixed to insulated blocks secured to it. There are four carbon brushes. The brushes are electrically connected together in pairs, the first and the third and the second and the fourth having insulated wires joining them together. The wires leading from the armature to the controller pass from the external terminals, P^1. The casting, M^3, is provided with openings, as seen in Fig. 13, which are normally covered by a sheet-metal ring, M^5 (Fig. 12). The ring renders the motor dust-proof and the brushes easy of access. The reservoirs, M^4, for the oil in both bearings, form a part of the castings, M^1 and M^3; both the bearings are of ample length. The armature, R, which is a very neat bit of work, is clearly shown in Fig. 14. It is of the drum type, and is wound in a special manner. Its shaft is fitted with the double helical pinion, N, and terminates in the brake-drum, E. The corresponding spur-wheel on the differential has, of course, teeth of a similar shape; and it is of large size. The use of this "herring-bone" type of gear, although considerably more expensive to make, is amply justified by the smoothness and the silence of running which it ensures.

In the double motor equipment the differential gear is dispensed with, and each half of the live axle terminates at the inner end in a double helical spur wheel. The two motors are fixed to the casing which encloses the gear wheels, one on each side of it, and similar pinions to those shown in our illustrations are fixed on the inner ends of the armature shafts; the motors are only connected with one another indirectly—through the rear-wheels by the road. By this arrangement one motor drives each of the rear wheels, and the necessary differential action is secured without the mechanical complication involved by a differential. In these larger cars there is no band-brake on either of the motor shafts, and the side brakes, together with the electric brake, are found to be amply sufficient for all requirements.

The motors are shunt wound, and the controller is arranged so that when the hand lever, B, is put in its first driving position, the current passes through a resistance, J^1, to the armature, and through the two sets of field magnet windings in parallel. When the lever is moved to its next notch forward, the same connections are retained, but the resistance in the armature circuit is cut out, thus making the motor an ordinary direct-connected shunt machine with a very strong field. In its third position the controller places all the field magnet windings in series with one another, and these are connected up across the battery terminals in parallel with the armature. In this case, therefore, a direct-connected shunt-wound motor is in use, and the weakened field gives the necessary increase of speed. When the hand lever is pushed backward from its neutral position, in which it only established the necessary connection for re-charging through the ammeter, the electric brake effect is produced by utilising the motor as a dynamo, and connecting its terminals across the resistance coils, J^1. All the various connections made by this controller are shown diagrammatically in Fig. 15, and the complete electrical connections on the car are given in Fig. 16. The reversing switch does not call for any special mention, for the connections made by it are the same as in ordinary electric practice.

The cars which have a pair of motors are provided with 40 cells of the same size as on the smaller vehicles, and the entire battery is connected up in series. The two motors are placed in series with one another by the controller, and changes of speed are obtained in a very similar manner to that which we have already described in connection with the smaller cars.

A very complete set of accessories is included with the Waverley vehicles, the majority of which are seen in Fig. 17. The most important of them is the combined switchboard and variable rheostat, S, for regulating the current when recharging the cells. It is intended to be fixed in the garage where the car is usually kept, and it is, of course, connected with the source of supply. It is suitable for use on any *direct*-current supply mains, where the E.M.F. does not exceed 120 volts. The charging plug, T, fits the sockets, J (Fig. 10), which have already been mentioned, and the wires connected with it lead to the switchboard, S. The cells can be filled up with electrolyte when necessary by means of the rubber filler, U, and the specific gravity can be taken with the hydrometer, V. In addition to the oil-can, W, and the useful set of tools, X, a waterproof coat for the driver is included in the outfit.

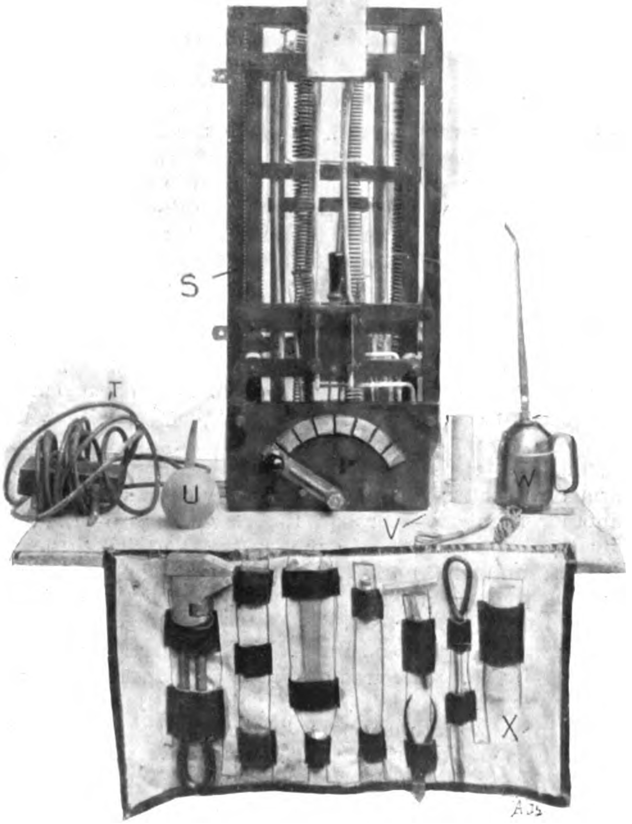


FIG. 17.—Charging Switch with Rheostat and other Accessories supplied with Waverley Electromobiles.

The Waverley vehicles run at speeds of up to fifteen miles an hour, and are capable of running about forty miles on one charge. Their ease of control renders them suitable for use in the hands of those who may have no mechanical knowledge whatever, and the rapidity with which they can be started and stopped makes them particularly handy for driving in heavy traffic. For these reasons we expect that they will become very popular amongst those living in the West End, for it is difficult to conceive of a more pleasant means of getting about in town.

A word of warning, however, should be given to those who are not familiar with the idiosyncrasies of accumulators, and to those who do not know that the life of a battery depends, to an enormous extent, upon its considerate treatment. It is particularly important to know that the cells should not be used after they have been discharged down to a reasonable degree, and that the battery should never be allowed to stand for any lengthy period without being recharged; for other valuable information concerning their management we would refer those interested to the special articles on the subject which have appeared in our columns, Vol. IV., pp. 409, 410.

THE United States War Department are about to experiment with a motor battery wagon, which will be in charge of Capt. C. B. Wheeler, of the Ordnance Department. It is to be completed by about July 1st, will be driven by a 40-h.p. 4-cylinder petrol motor, and will be fitted with solid rubber tyres on 54-inch wheels. The total weight of the wagon will be 12,000 lbs., with a carrying capacity of 5,000 lbs. Twelve miles per hour will be the maximum speed, and the vehicle will be practically a machine shop on wheels, replacing a horse wagon now used for the same purpose drawn by six horses. Economy both in men and speed is anticipated.

M. DE CRENNER announced last week, in Paris, that he is organising a system of automobile cabs for the French capital to be worked on the taxameter principle. He states that the service will commence with 120 cabs, and increase in number gradually. The lowest fare is to be 5*d.* for one mile. The charge for two hours will be 4*s.*, and 10*s.* for the day. Outside the fortifications 10*d.* extra per 30 minutes will be charged. From the Madeleine to the Bastille the fare will be 1*s.* 2*d.*, and ten minutes will be occupied between the two points. We sincerely wish M. Crenner success in his enterprise. Our only regret is that such a scheme is not available for London.

MESSRS. O'HALLORAN BROTHERS AND CO., of 164, Clerkenwell Road, E.C., have been appointed sole agents for all countries outside the United States for the Crest cars, manufactured by the Crest Manufacturing Company, of Cambridge, Mass., U.S.A. This firm will shortly have ready for delivery a stock of the specialities of the Crest Company. These include a 5-h.p. air-cooled light touring car with vertical motor, two speeds and reverse, all essential gears being cased in. Two lighter cars, of 3½-h.p. each, will be marketed, one of which is claimed to be the lightest car introduced to the British market, weighing only 500 lbs. The retail price of this little roundabout is to be one hundred guineas.

THE CHABOCHE STEAM CARS.—PART II.

Continued from March 28th, page 318.

We have already given a brief description of the system adopted in the Chaboche steam cars, and have indicated the position assigned to the various parts of the driving mechanism. Of the further illustrations which we give this week, Fig. 4 is a view from the right hand side of the chassis, in which the fuel tank (shown in Fig. 3) has been removed. Fig. 5 shows the front portion of the chassis from the opposite side, and on a larger scale than in Fig. 3; in this illustration the metal casing covering the cylinders has been taken off, and they are well in evidence. Several parts which were not visible in Figs. 2 and 3, but which have already been mentioned, are to be seen in Fig. 4, and we would call particular attention to the fuel pump, B, with its pressure-regulating handle, B^1, to the steam pipe, Q, with its enclosing steel pipe, Q^1, and to the automatic fuel-feed valve, E, by which the heat of the burner is automatically controlled in accordance with the temperature of the steam when it passes from the boiler to the engine.

The Engine and Transmission Gear.

The construction of the engine, the cylinders of which lie transversely and nearly horizontally, and the change-speed-gear will be gathered from Figs. 6, 7, and 8; Fig. 7 showing one of the cylinders with the steam chest cover, U^4, removed, Fig. 8 being a view of the combined crank-chamber and gear-case, and Fig. 6 being a line drawing in which these portions of the mechanism are shown diagrammatically. The moving parts run in oil, and are closed in from above by a flat lid, which has been taken off in Fig. 8. The double-acting cylinders are bolted to the body of the casing. The cylinders of the 12-h.p. engine have a bore of 72 mm., and the stroke is 80 mm. The crank-shaft is supported in four bearings; it passes through the casing at its forward end only, and does so in order to carry the fan, W^8, which draws air through the condenser. The crank-shaft is fitted with the three spur-wheels, U^7, U^8, and Y^2. The wheels, U^7 and U^8, which are of unequal size, are always in mesh with the corresponding wheels, W^7 and W^8, respectively, on a lay-shaft mounted inside the casing. These wheels normally run idly upon the lay-shaft, but either of them can be clutched to it by a two-way jaw-clutch fitting, V, which is caused to slide along the shaft by a fork, V^3, in accordance with the movements of the hand-lever, V^1 (already referred to) on the steering pillar. The lay-shaft carries a third spur-wheel, W^6, which is fixed securely to it and meshes with a wheel, W^4, on the inner end of a short shaft passing through the back end of the casing and carried in a long bearing. The outer end of the short shaft is provided with a universal joint, which forms part of the propeller shaft, W, connecting the gearing with the live-rear-axle. The jaw-clutches, V, are so made that the engine can be allowed to run free or to drive the rear wheels through the low gear (provided by the wheels, U^8 and W^8), or through the high gear (resulting from the employment of the wheels, U^7 and W^7). The lay-shaft carrying the wheels, W^6, W^7, and W^8, as also the short shaft on which the wheel, W^4, is mounted, are provided with ball bearings, and the bearings for the other end of the propeller shaft are also of the same type. When using the high gear the lay-shaft and the crank-shaft run at approximately the same speed as one another, but when the low gear is in use the latter revolves at about one-half the speed of the former. The wheel, W^6, is slightly smaller than the wheel, W^4, so that the propeller-shaft, W, runs a little slower than the lay-shaft. The propeller-shaft itself has a telescopic joint, in addition to universal joints at either end, so that the change-speed gear is flexibly connected with the back axle. The rear springs are pivoted to the frame at their forward ends, and are connected with it by shackles at their rear ends; since there are no radius rods between the axle and the frame, the springs therefore take all such torsional strains as are imposed by the bevel gear. As seen in our illustrations, the differential, and the bevel wheels driving it, are completely cased in, and run in an oil bath. The back axle has plain bearings, but a ball thrust is fitted behind the large bevel wheel on it. The rear wheels are made in such a manner that they can be removed without disturbing the axles; for this purpose the hubs are constructed in two pieces, the inner portion being rigidly fixed to the axle, and the outer portion sliding over it. The wheel is held on by a large nut, and the drive is taken by a projection on it which fits into a corresponding recess in the brake drum casting.

The two cranks on the crank-shaft of the engine are set at right angles to one another, and both the cylinders are supplied with high-pressure steam. There are no dead centres, because the cylinders are double acting, and a very steady turning movement is thus obtained. The connecting rods and the eccentric straps are made in such a manner that the nuts by which any wear of their bearing surfaces is taken up are above the level of the oil in the casing; these bearings can therefore be adjusted very readily.

The slide valves are operated through a link-motion reversing gear of much the usual pattern; the direction in which the engine runs is controlled by the side lever, U^3, to which reference has already been made. One of the slide valves, U^5, carried loosely in the strap which surrounds it, is seen in Fig. 7. It is in that position in which steam would be admitted through the port, U^6, to the back end of the cylinder. The steam chest cover, U^4, is held in place by six studs; it is made wedge-shaped in order to render the slide valve the more accessible. In this illustration the steam pipe, S^2, and the exhaust pipe, S^3, as also one of the drain cocks, U^1, are clearly visible.

The mechanical feed-pumps, H and B, for the water and fuel respectively, are bolted to the sides of the main casing. The former is driven by a connecting-rod from a crank-pin on a small lay-shaft, Y, and the latter is driven by an eccentric mounted on the same shaft. This shaft, Y, is driven from the crank-shaft by the spur-wheels, Y^1 and Y^2, the former of which (that on the shaft, Y) is considerably larger than the latter; the pumps consequently run at a lower speed than the engine. The pumps themselves project outwardly from the crank-chamber; their valves are therefore readily accessible, whilst the moving portions are thoroughly lubricated at all times. The fuel-pump, B, with its partly automatic, and partly hand-controlled, relief-valve, will be referred to and shown in a separate illustration subsequently, and we shall also give a drawing of the water-pump, H, later.

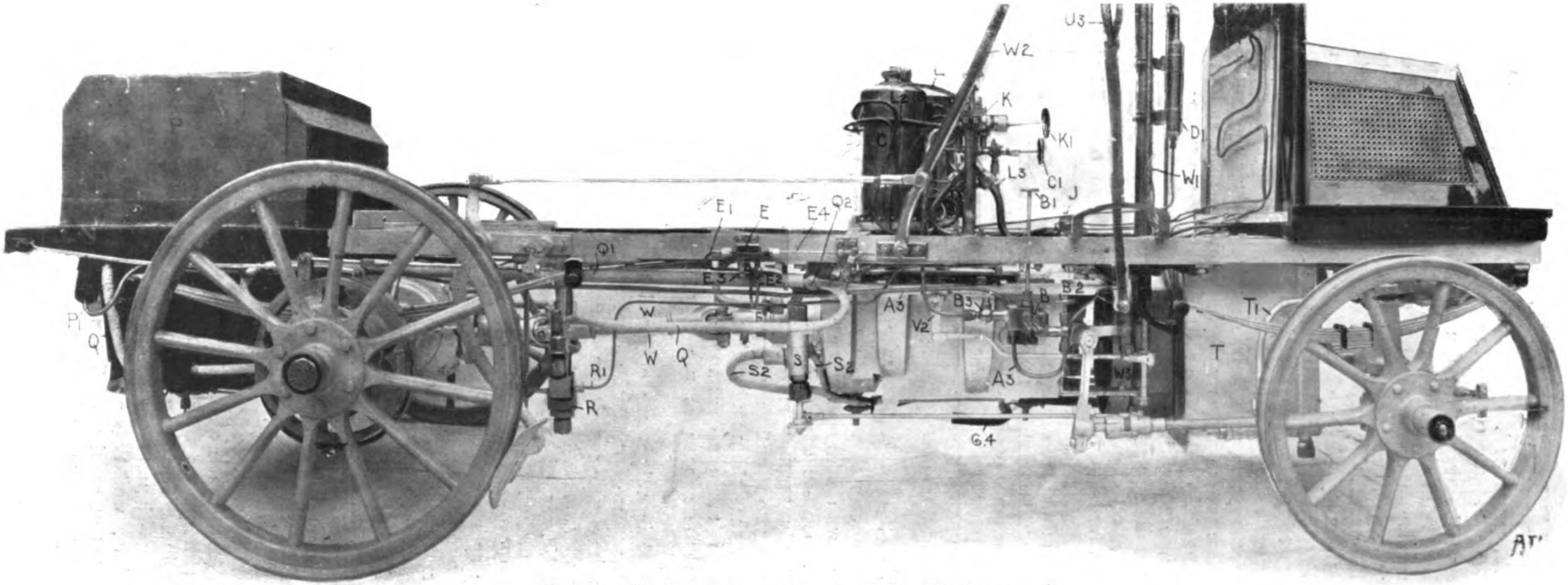


FIG. 4.—Side (right) view of Chassis, the Fuel Tank removed.

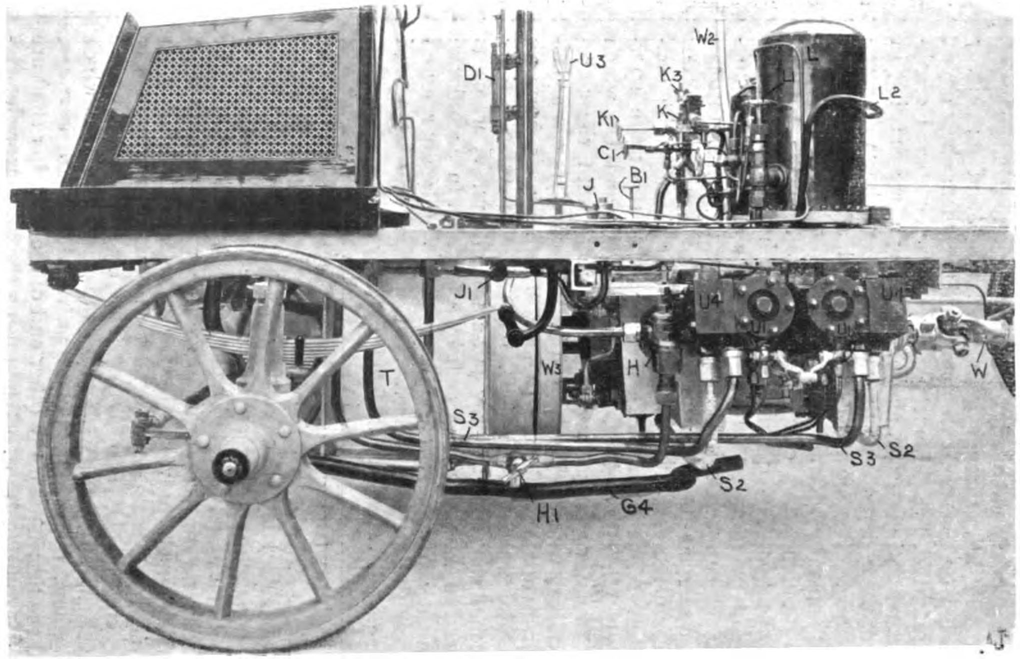


FIG. 5.—Left side (front portion) of Chassis, the Casing over Cylinders removed.

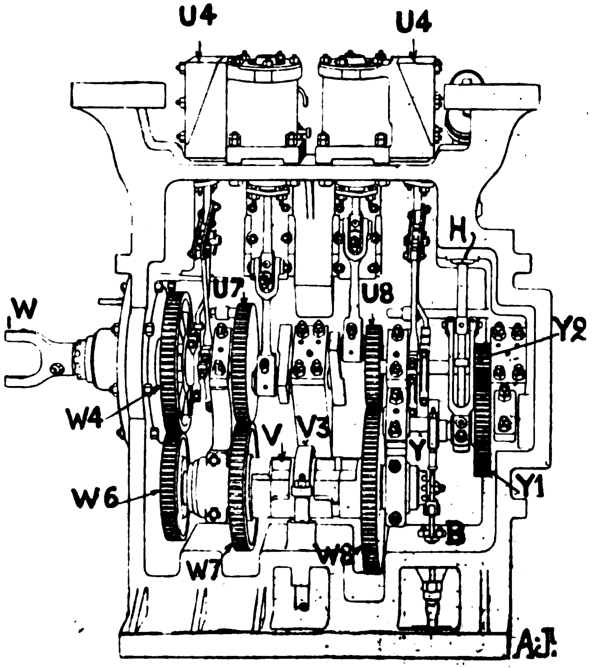


FIG. 6.—Plan of Engine, Change-speed-Gear and Mechanical Feed-Pumps.

THE CHABOCHE STEAM CAR.

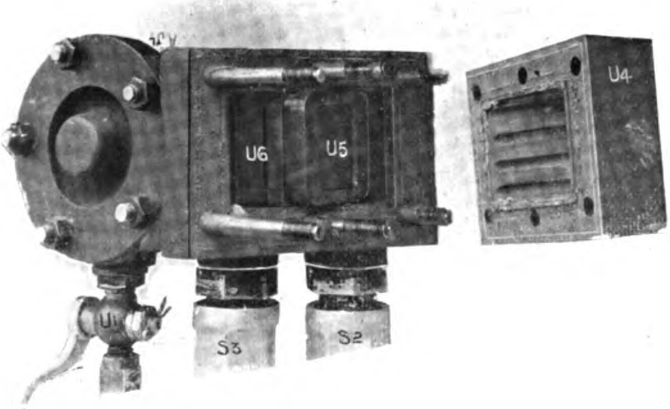


FIG. 7.—One of the Cylinders, with Steam Chest Cover removed.

Several other portions of the mechanism are also seen in Fig. 8, including the hand-operated feed-water pump, J (its operating handle removed), the automatic feed-water by-pass apparatus, K, and the pressure tanks, C, X, and L, for fuel, lubricating oil, and water respectively. In this illustration the handle, B^1, for regulating the pressure on the fuel, the cock, K^1, for cutting off the water-feed to the boiler, the needle valve, C^1, for regulating the fuel-feed to the burner, and the stop-cocks, X^1, X^2, and L^3, are also prominent.

(*To be continued.*)

MR. MERVYN O'GORMAN, M.I.E.E., is announced to contribute one of the Westminster lectures, which are delivered weekly at the Old Westminster Town Hall. Mr. O'Gorman will speak on May 8th, and his subject will be "The Motor Car: Its Most Economical Use, Its Construction, and the Immediate Future Probably Before It." The lecture commences at 3.30 p.m.

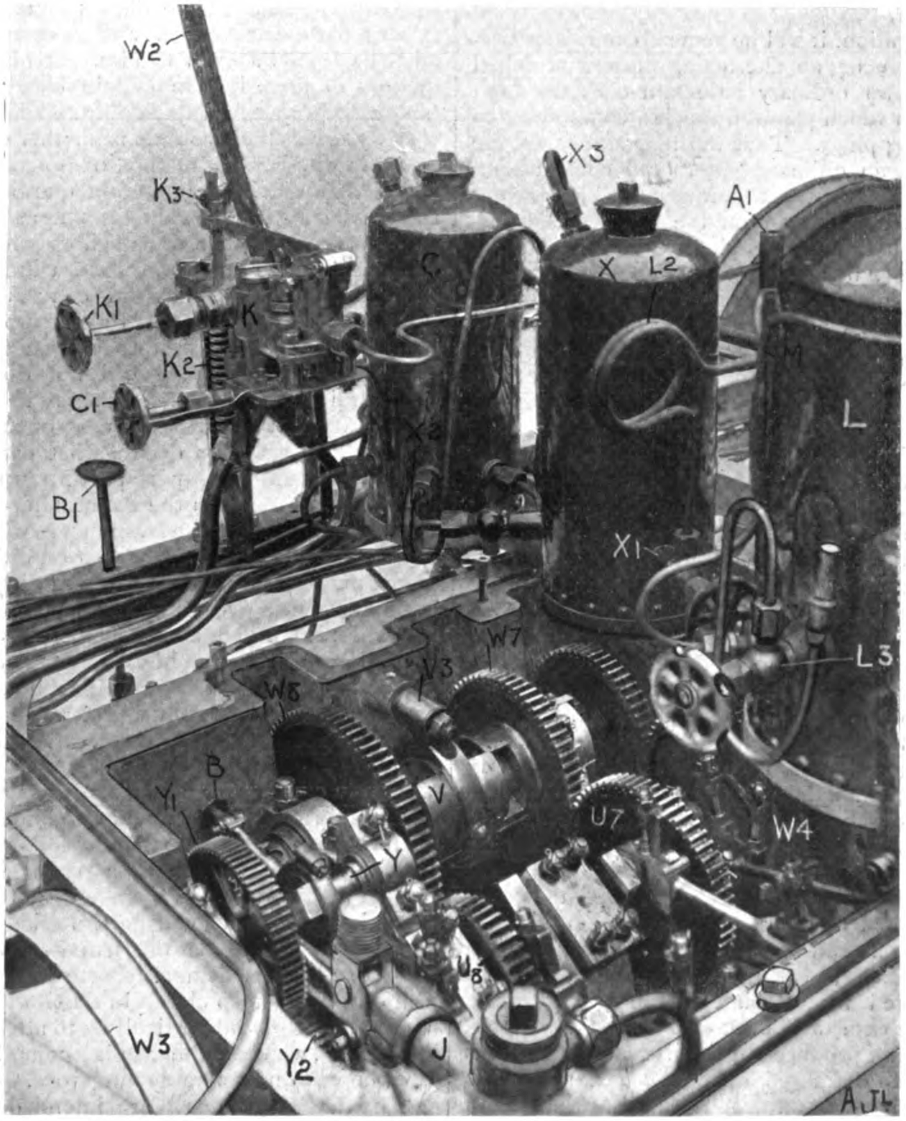


FIG. 8.—View of combined Crank-Chamber, and Change-Gear-Casing. Also showing Pressure Chambers.

NEW METHODS OF ELECTRIC IGNITION.

ALMOST every week sees the introduction of some new form of electric ignition or some more or less important variation in existing types. We have already dealt collectively with some of the more recent of these (AUTOMOTOR JOURNAL for March 7th last), specially designed to ensure absolute synchronism of the spark in multi-cylinder engines.

The low-tension magneto system of ignition has, as our readers are aware, many advantages. Amongst other things it produces a particularly hot and certain spark. Owing, however, to the fact that the contacts have to be mechanically separated in each of the cylinders to which it is applied, considerable difficulty is experienced in obtaining complete synchronism. This has led to the introduction of a variation of the well-known Bosch ignition by means of which it is adapted for use with ordinary ignition plugs in which no moving contact is employed, while it to a certain extent preserves the "body" of the ordinary magneto spark, and is in addition capable of perfect synchronisation.

The new Bosch ignition has points of resemblance with the Eisemann system.

The Eisemann ignition, it will be remembered, is practically a magneto producing an alternating current arranged in connection with an ordinary induction coil, the high tension current from which passes through a commutator to the different sparking plugs. Thus the magneto takes the place of a battery in an ordinary battery and coil ignition, while the coil, in conjunction with a mechanical interrupter and a high-tension commutator on the magneto, for distributing the spark to the various plugs, enables practically perfect synchronism to be obtained. As applied to a four-cylinder motor, the contact-breaker is operated by a double cam on a spindle driven at the same speed as the crankshaft of the engine, and this spindle is that of the magneto armature. A small upper shaft driven at half-speed carries the four-contact high-tension commutator for the ignition plugs.

In the new Bosch ignition the coil and magneto may be said to be combined in one; that is to say, the armature of the magneto is wound with two coils, a stout-wire winding corresponding to its ordinary winding, and performing the same rôle as the winding of the magneto in the Eisemann ignition, and a second high tension fine-wire winding corresponding to the high tension or secondary winding of the Eisemann separate coil, but wound also on the armature core of the magneto. The stout-wire winding of the armature is provided with a contact-breaker operated by a cam, and has a condenser connected across the contact-breaker. At the moment when the movement of the armature-shield tends to generate a strong current in its stout or primary winding the latter is short-circuited through the contact-breaker, and considerable magnetisation of the armature core results. When the contact-breaker is operated to break the contact the whole armature acts exactly like an induction coil at the moment of the "break." The high-tension winding is connected to one terminal of the spark plug, its opposite end being connected to one end of the low-tension winding, the opposite end of which is earthed. A high-tension commutator is employed for distributing the spark to the various plugs in the case of a multi-cylinder engine. It is claimed that the spark produced by the new Bosch igniter is much hotter than an ordinary induction coil spark, and is as effective as the low-tension magneto spark, while it can be perfectly synchronised.

PATENTS FROM THE MANUFACTURERS' POINT OF VIEW.

Continued from page 468, *Vol. VII.*

The Action for Infringement.

HOWEVER careful, not to say ingenious, a patentee may have been in arranging on any of the methods which we have described above, for working his patent along what may be looked upon as the line of least resistance, occasions are certain to arise when he will find himself compelled either to forego the advantages of being a patentee at all or to take action against infringement. On the wisdom and ability with which that action is conducted the future of his patent will and the value of an important property may depend. It is on this account that the fees charged by the leading patent barristers run into so many figures. There is hardly any class of legal action in which larger sums are at stake than in patent litigation, or in which the successful barrister who wins his case is so worthy of liberal remuneration.

In all affairs of life there is a certain tendency for people who do not come into contact frequently with the law to select a particular solicitor, and more or less blindly entrust all their legal business to him. It may be a satisfactory method of procedure in certain classes of business, and undoubtedly saves clients anxiety and deliberation. Whether it always saves their pockets is another question. It is very doubtful whether this method of procedure is a wise one to adopt where such an important question as an action for the infringement of a valuable patent is concerned; there are a certain number of solicitors who are specialists in patent actions, and who have triumphantly conducted several cases to a successful conclusion. An intending litigant would, if he prefers to give up all control of the action himself, do well to entrust the case to such a firm of solicitors. He will not do well to entrust it to an ordinary practitioner, who may be an excellent man to advise either in ordinary business or the average affairs of life. The best way to decide what particular firm of solicitors he should employ is to turn up the Patent Office reports of cases, say in the Patent Office Library. In these reports the names of the solicitors, as well as of the barristers and expert witnesses who appear on either side, are always given, and he will see that the same barristers and experts appear over and over again in all the more important cases. He will also find that the names of solicitors conducting them do the same, and he is thus provided with the list of solicitors who appeared from this source. He will do well to make a selection, giving preference to those who have conducted the successful cases. He will not find the list an embarrassingly large one.

In any case, however, a patentee, particularly if he is a manufacturing patentee, ought to know more about things than to be compelled to blindly follow the guidance of a solicitor, however able, in a patent infringement action. Such an action differs from most other legal actions in involving very particular expert knowledge, and that is just the kind of knowledge that the patentee will probably possess in an exceptional degree. Possessing that knowledge, he will do well to keep closely in touch with all the steps taken by his solicitor, and particularly to attend the consultations of counsel, which, if the case is a complicated and important one, he will find tolerably numerous.

The following remarks are intended for the guidance of litigants who are not anxious to adopt merely a passive rôle, and having instructed their solicitors, propose to sit still and trust to good fortune and the abilities of their advisers to pull them through.

There are two main questions in which the litigant will do well to exercise a controlling force over the action of his solicitor. These are in the selection of counsel and expert witnesses.

Solicitors, of course, always have the interest of their clients at heart, but the best of solicitors very naturally also have interests of their own. It is generally supposed by the outside world that the patronage exercised in the legal profession is always employed by solicitors in favour of barristers, and that the barristers are not in a position in any way to repay the solicitors by conferring equivalent benefits. There is no greater delusion than this. Occasions arise only too frequently in which a solicitor may have an interest in briefing a barrister, who is not by any means necessarily the best man for the particular case in hand. The same thing is even more true with regard to the relations prevailing between solicitors and expert witnesses. The amount of business which an expert witness, who is also, as a rule, a consulting engineer, can put into the hands of certain solicitors, is quite surprising, and the interest of the solicitors in such cases does not necessarily correspond to more than a limited extent with that of his client. The litigant, therefore, cannot be too careful to possess himself by all possible means of information which will enable him to decide who are the best counsel and the best expert witnesses for the particular kind of action he is bringing. The method we have already indicated is one of those which he may adopt to obtain information on these points—examination of the Patent Office reports. It would often be well worth his time in addition to attend a few important cases in the Courts and form his own opinion of the abilities of the barristers and witnesses engaged. If he can succeed in getting a certain amount of acquaintance with persons largely occupied in these lines, he will find himself the possessor of valuable information.

Both barristers and expert witnesses differ in their particular forte. The general management of the case, cross-examination of witnesses and the capacity for plausible statement, so as to convince the judge—are possessed in a high degree by the leading patent barristers, but a tremendous lot of work has to be done in a case, the careful examination of all documents, alleged anticipations and the like, in the general roughing down for the benefit of the leading barrister, and this generally falls in part to the junior and one or more of the expert witnesses. A good junior and a good expert witness to do this work are highly important. Again barristers differ in their particular fortes. One may be unequalled in electrical cases, while capable of making a much less satisfactory fight in matters dealing, say with a chemical invention. Another may be unrivalled in chemical cases and very liable to get into difficulties on complicated mechanical subjects. Above all, there is the great question of tact and demeanour, and many a case has been ruined by an able man for want of the tact and the ability to intuitively recognise when a particular line of argument or method of conducting the case was not producing its desired effect upon the judge.

Solicitors who have not the special experience necessary to enable them to settle these points are only too likely, if not controlled by their client (whom we are endeavouring to put in a position to do so) to engage what may be called a merely ornamental bar. They brief a number of barristers, who have a high reputation generally, without any consideration as to whether their particular capabilities suit them for the case on which they are engaged. This method of procedure invariably spells disaster.

The same general observations apply to the selection of expert witnesses. At least two first-class expert witnesses will be required to give evidence in the witness-box. They ought to be selected on much the same grounds as barristers, that is to say, for their general ability and tact, their acquaintanceship with the particular class of invention, and their ability to undergo and maintain their position with equanimity under severe cross-examination. Perhaps not the least important quality they should possess is that of ingenuousness or apparent ingenuousness. The inexperienced witness, however able he may be, however acquainted with the subject on which he is giving evidence, may be manœuvred by an expert barrister into conveying to the judge the impression that he is holding something back, or not telling the whole truth about it, though he may all the time be acting with perfect *bona fides*. If he is betrayed into such an attitude, it is likely to have a very serious effect on the side by which he is engaged. In addition to these two or more first-class experts, who may to a certain extent be looked upon as the fighting line, at least one good man should be available to get up the general details of the case, the various bearings of the alleged anticipations, and generally assist the junior barrister in coaching up the leaders. Such a man need not have any witness-box experience at all, he should not be let into the box as a general rule, as he ought to be a specialist in that particular line, viz., in getting up cases and coaching counsel.

The above remarks apply to the conduct of a case, both from the point of view of the plaintiff or patentee, and that of the defendant or alleged infringer.

(*To be continued.*)

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

LAMPS.

To the Editor of The Automotor Journal.

Sir,—*Apropos* of a paragraph on this subject on page 388 of your issue for April 11th, I should like to point out that neither the use of an independent red lamp, nor, in many cases, the placing of the side lamps on the dashboard, is a proper compliance with the Act, which runs as follows—the italics being mine:—

"*The* lamp to be carried . . . shall be so constructed and placed as to exhibit . . . a white light visible within a reasonable distance in the direction towards which the light locomotive is proceeding or is intended to proceed, *and* to exhibit a red light so visible in the reverse direction. The lamp shall be placed on *the extreme* right, or off side, of the light locomotive in such a position as to be free from all obstruction to the light."

In many cars with bulging tonneaus the lamps on the dashboard are certainly not on the extreme right, and their red backlight, if they have one, is practically useless.

It seems to be often overlooked that lamps on a vehicle are needed, not only to light up the road for their owner, but to indicate to an approaching driver the amount of space he must allow for passing: and that if the side lights are considerably "inboard," a grazing collision may be the result.

The best position for side lights would seem to be on a level with the back of the driver's seat, for not only would such a position comply with the two requirements above referred to, and there would then be no need of an extra red lamp, which may perhaps go out without the driver's knowledge, but they could be lit and tended without leaving the seat; and would serve to illuminate the apparatus on the dashboard, or a map or watch, if it were necessary to consult either.

Your obedient Servant, Faber.

REVIEWS OF BOOKS.

"Two Thousand Miles on an Automobile." By "Chauffeur."
J. B. Lippincott and Co., Philadelphia and London.

Never was there such a barefaced piece of book-making as this work. It is an automobile tour, no doubt, but of its three hundred odd pages, we doubt very much whether automobilism, pure and simple, takes up more than about ten per cent., if as much. It is book-making, we say; but in saying this we would like to point out that there is book-making and book-making—book-making which is mere padding, and book-making which, though simple irrelevancy, may be so excellent of its kind as to justify its existence. The book-making to which we refer in "Two Thousand Miles on an Automobile" is of the latter class. It is magnificently and gloriously irrelevant, but it is delightful from beginning to end. We are simply taken about the United States on an automobile, and introduced to places of interest, in long chapters, where the automobile itself merely looks in at the start and finish, and that in an amateurish way. Amongst other places, we arrive at Lexington and Concord, celebrated in the War of Independence, where also resided at one time Emerson, Hawthorne, and Thoreau, and we have seventy pages about these worthies. The whole volume is alike, and is most amusingly and brightly written. There are plenty of other digressions. In fact, the book is all digressions, and some of them of literary value. It would be impossible to give adequate samples of the delightful remarks strewn up and down, but one of them deserves preserving: "There never has been but one real American, and that was Phineas T. Barnum. He was the genuine product of his country and his times—native ore without foreign dross. He knew the American people as no man before or since has known them; he knew what the American people wanted, and gave it to them in large unadulterated doses—humbug." Good things from time to time are also said about the automobile, and particularly about the country mechanic who is always ready to repair, and is often more destructive than a collision with a tramcar. "Look out for him; his look of intelligence is deception itself. His readiness with hammer and file means destruction; if he once gets at the machine, give it to him as a reward and a revenge for his misdirected energy, and save time by walking." The author is evidently a man of much humanity, and he would not willingly run over a dog, or occasion discomfort to a fly; but the treatment he proposes to give to accumulators would certainly meet with the reprobation of the society for preventing cruelty to those useful appliances. When you can no longer get your coil to spark with in any other way you are advised to put them in series. In conclusion, we would quote the author's remarks on the effects which automobilism is likely to have on the future development of the country:—"The automobile will bring new life to these deserted hostelries. For more than half a century steam has diverted their custom. Coaching is a fad, not a fashion; but automobiling bids fair to carry the people once more into the country, and there must be inns to receive them. But gasoline and lubricating oils are absolutely essential to the permanent prosperity of any well-conducted wayside inn." We hope the day will soon dawn when all country inns will follow the writer's advice and keep gasoline, lubricating oils, and repairing appliances always ready. The book is amusing, and often delightfully chatty; but it is rather of the guide book order, and will disappoint anybody who expects genuine adventures of an automobilist.

THE LINCOLNSHIRE AUTOMOBILE CLUB.

The Complimentary Luncheon given to the Road Surveyors of Lincolnshire by the Lincolnshire Automobile Club on the 16th instant, was an unqualified success. Among those present were Mr. W. Garfit, M.P., Sir Hickman Bacon, Bart., Capt. Ruston, J.P., Mr. Embledon Fox, J.P. (Chairman of the Lindsey County Council), Mr. J. D. Sanders, J.P., Capt. J. A. Cole, J.P., and Mr. E. P. Hooley, County Surveyor of Notts and Lincoln. Thirty-nine road surveyors were present, and in all 109 members and guests sat down to lunch. Mr. Garfit occupied the Chair.

Sir Hickman Bacon, Bart., the President of the Club, in proposing the Houses of Parliament, speaking as perhaps the only one in the Club in favour of numbering, said he thought that automobilists would have to exchange identification for the abolition or extension of the present speed limit. He did not believe in the malicious persecution by police and public which was said would follow.

Mr. Garfit, in responding, said he was in favour of the abolition of the limit, and the strong punishment of wrongdoers. It was the scorchers who did more harm than could be imagined to the cause.

Mr. E. P. Hooley thought that the Lincolnshire roads had improved wonderfully of late years, especially as Lincolnshire had no local stone. Everything had to be brought in. Many difficulties, such as no water for steam rollers, had to be faced, which were all against the surveyors. He should like to see greater confidence exhibited in the surveyors by the County Councils. Less meddlesome interference by ignorant nobodies with those whose business it was to see to the roads would result in far better roads. He was surprised to find that on the Departmental Committee being formed in the Houses of Parliament there was not a single surveyor or similar authority, and he thought it very singular that there was not one experienced road maker on that Committee. Referring to the dust problem, he said he had tried for 10 years to secure a road material that would defy the weather, the greatest enemy. He found that furnace slag could be made into a splendid material that would wear well, but not absorb moisture and throw it off in the way of mud as granite would. He found that by getting the slag about 18 hours old the temperature was right, but he could not get manual labour to mix it, so he devised a machine that turned out tarred macadam properly saturated. The absorption tests were, granite 2·8 gallons per ton, in 24 hours; slag, 3·745; and the new material, 0·278 only. He had had some down four years, and it had not been touched. It was cheaper than other material, and wore longer. A trial two miles was being put down on one of the worst roads in Notts.

Captain Cole, who congratulated the county authorities on their tolerance to automobilists, said that so far only five members of the club had been proceeded against. He thought that the result of that gathering would result in an even more friendly feeling between the surveyors and automobilists.

Mr. Embledon Fox stated that the County Councils Association were agreed as to the necessity of removing all limitations as to the pace of motors, but they insisted that there must be some means of identification and greater punishment for repeated offences. He thought the solution to the whole difficulty was the abolition of the speed limit, identification, the application to automobilists of the ordinary law, and increase of punishment for repeated offences.

Mr. Rees Jeffreys proposed "The Lincolnshire Automobile Club."

Mr. Craig, the Honorary Secretary, responded, and gave a very enthusiastic sketch of the future ideal motor which would cut the corn, bring it home, thrash it, cut the chaff, pulp the turnips, and do all sorts of other agricultural work. There were a number of such motors already in active work in the neighbourhood, and further demonstrations of their capabilities had been arranged to show their practical possibilities to the Lincolnshire farmers.

After lunch about 20 cars proceeded to the "White Hart," Sleaford, where 44 guests sat down to tea.

The Lincolnshire Club must be congratulated upon being one of the most active and pushing clubs in the interests of automobilism generally.

SCOTTISH AUTOMOBILE CLUB (Eastern Section).

On Saturday last the first Club Run of the season took place from Edinburgh to Middleton Hall, the residence of Mr. H. E. Moss, J.P., who drives a Daimler car. Those who took part in the visit included: Messrs. John Macdonald (Chairman), 12-h.p. Beaufort; MacIntyre, Oldsmobile; George Macmillan with Mr. Norman D. Macdonald, 16-h.p. De Dietrich; Andrew Melvyn, 10-h.p. Panhard; James Inglis, 9-h.p. De Dion; J. Cruikshank, 8-h.p. Argyll; W. L. Sleigh, 8-h.p. Peugeot; John Lamb, 10-h.p. Arrol Johnston; Stevenson, 9-h.p. Waverley; A. U. Barr, 7½-h.p. Wolseley; T. F. Ross, 10-h.p.

Waverley; H. Clelland, Renault; J. Love, 10-h.p. Albion; R. Wilson, 10-h.p. Albion. Although cold, the weather was favourable and the roads in splendid condition. The route taken was viâ Newington and Liberton to Mr. Moss's residence, where excellent hospitality was enjoyed by the visitors, Edinburgh being again reached at about seven o'clock in the evening.

NEW MOTOR WORKS FOR BURTON-ON-TRENT.

Last week the new motor car works of the Ryknield Engine Company, Limited, of Burton-on-Trent, were formally inaugurated. A special significance attached to this function, inasmuch as the manufacture of motor vehicles is the first new industry to supplement the present wage-earning capacity of the town—brewing. Indeed, the manufacture of self-propelled vehicles becomes at once the secondary industry of the town, and who knows, as the chairman of directors remarked, that the time may not come when Burton-on-Trent may be as celebrated for its motor works as it is at present for its breweries? One advantage enjoyed by the company is that it is not over-capitalized, while it is in the happy position of having almost exhaustless capital at its beck and call to meet future requirements. The site of the works occupies about 6½ acres facing the Midland main line, about 200 yards from the station. Of the stated capital of £30,000 (in £1 ordinary shares), £20,000 has been called up. Light steam delivery vans to carry from 1 ton to 30 cwt. will be a speciality of the company, while for pleasure purposes a 10- to 12-h.p. car driven by a vertical 2-cylinder petrol engine will be built. The first of these may be seen on the road next month. Next year it is proposed to bring out the 4-cylinder car of from 16 to 20 h.p. It is hoped that next year quite 150 cars will be issued from the works, and it is also hoped that 100 motor vehicles will be turned out during the present year. In another month's time 30 or 40 men will be at work, and when the works are in full swing a much larger number will find employment in the Ryknield shops. So far as the directors can see at present, they do not propose to construct cars propelled by electricity or motor bicycles. An expert manager has been appointed in Mr. Bagguley, who formerly held a similar position at the Bagnall Works, Stafford.

The directors invited a number of gentlemen interested in the automobile movement to join them at lunch, which was served in the commodious offices of the firm on the day of the inauguration. Lord Burton, the head of the famous firm of Bass and Co., wished success to the firm in a bright little speech. He spoke of the ability and zeal of the directors, and especially of their chairman (Mr. A. J. Clay, of Holly Bush). They were often twitted that this town was a one-man show, that the prosperity of the town depended upon one business only, and, therefore, they should welcome anything that tended to give other outlets for their workmen and profit making. In wishing all prosperity to the Ryknield Company, its chairman, and directors, he hoped they would all show their practical interest in it by purchasing their motor cars as soon as possible.

In replying to the toast, Mr. Clay said he did not think he was far wrong when he said that there was no company at present concerned in the construction of motor vehicles which had, for its size, shops better designed and more modernly fitted than their own shops were. Of course they were only in the experimental stage, and could not show all those magnificent tools were capable of doing. Some of the lathes did five or six times more work, and did it more accurately and at lower cost than many lathes in existence, but most of the machinery was British made throughout. The premises were arranged for extension, so that they could be doubled, trebled, or even quadrupled, not only without interrupting, but even without interfering with, the work going on. They were essentially a manufacturing and not a financial company. All connected with it were enthusiastic motorists, and, whether small or large dividends were declared, would turn out nothing but work of the highest quality.

The company then left the offices and were taken for a tour of inspection around the works.

* * *

Over fifty members were elected this week to the Automobile Club. Amongst these were, Lieut. E. W. C. S. Clitherow, R.N.; Lieut. R. French-Brewster, Major H. S. Murray, Lieut.-Col. G. A. Percy, Sir R. J. Waldie-Griffith, Bart.; Lieut. Gilbert Russell, B.A.; the Hon. W. W. Vivian, Mr. Pandeli Ralli, Mr. E. G. McCorquodale, Sir Robert G. Harvey, Bart., J.P., D.L.; Capt. Sir R. K. Arbuthnot, Bart., R.N.; Lieut. F. J. O. Montagu, and Mr. James H. Ismay.

THE GORDON-BENNETT CUP AND IRISH FORTNIGHT.

The Eliminating Trial for the third place between the Napier cars driven by Messrs. Mark Mayhew, C. S. Rolls, and W. J. Stocks, and the Star car driven by Mr. E. Lisle, junr., takes place at Welbeck to-day (Saturday). On Friday evening a supper, followed by a smoking concert, is announced to be held by the Nottingham Automobile Club, at the headquarters of the Club, the Black Boy Hotel, Nottingham.

Following the first Eliminating Trial for the two vacant places in the American team, particulars of which we gave in last week's issue, a second test was carried out last Monday, again at Long Island, between Westbury and Merrick, the chief reason for this second trial being to give Mr. Harkness a chance of competing owing to his absence, through a damaged axle, when the first trial was run off. Only Messrs. Percy Owen—who covered a mile in 1 min. 2⅗ secs.—and L. P. Mooers, however, were again present with their cars, and it was therefore unnecessary to make any efforts at speed as there was no third competitor to eliminate. Although the trials were anything but convincing, the American Club judges appear to be satisfied by completing the team with Messrs. Owen and Mooers. Mr. Alexander Winton thinks, like Mr. S. F. Edge, that an average speed of 45 miles per hour will be good enough to win. The Winton cars and their drivers will sail for England on May 30th, bringing with them four racing cars.

Mr. Harkness, on Tuesday, had his 100-h.p. Peerless car in order, and was timed on Coney Island over the mile in 50 secs., equal to a speed of 72 miles or 115·87 kilometres per hour. Under the circumstances will the A.C.A. reconsider their selection for the American team?

The Panhard and the Mors firms will probably combine to hire a special steamer to convey their competing cars to Dublin. The vessel will serve, during their stay, to accommodate the French representatives and their assistants, and for keeping in readiness a full stock of every possible accessory and replacement which might be required for the cars.

Last week we mentioned that a Cup had been offered by Messrs. Wheatley, of Dublin. We are advised that this Cup is presented by Messrs. Wheatley and Bates, Limited, of Sheffield, the brewers of Wheatley's Hop Bitters. At the request of Mr. J. Hewitt, the Dublin agent of Messrs. Wheatley and Bates, Limited, Mr. R. J. Mecredy has chosen a £35 "Monteith" bowl of Irish manufacture.

During Easter week, the Hon. C. S. Rolls, on a 7-h.p. Panhard, went round the Cup course five times with Mr. S. F. Edge and Mr. C. Jarrott. Previous to this Mr. Rolls had driven his car from London to Holyhead—a distance of 280 miles—in about 13½ hours running time.

The Athy District Council are complaining of inconsiderate driving of cars over the course. Action is likely to be taken.

Possibly a motor cycle race meeting will be held on July 6th at Belfast.

TOURAINE TOURIST CAR TRIALS.

The A.C. de Touraine series of automobile competitions were held from April 16th to 20th, the rules being formulated upon novel lines. The principal event was a Tourist Competition for heavy and light cars and voiturettes, the various items taken into consideration being comfort, elegance of design, ease of working, regularity in running, cost price, the working cost per kilometre of distance covered, the weight as affecting undue wear of the pneumatic tyres. The distance run was 292 kiloms.—135 on April 17th and 157 on April 18th, April 19th being devoted to an exhibition of the competing cars. The apportionment of points was as follows :—1 point per 1000 fr. (or fraction) by the catalogue price ; 5 points per centime (fr. ·01) of the cost of running per car kilom. ; 1 point per 10 kilogs. of dead weight per seat ; 10 points per kilom. for an average speed over 30 kiloms. per hour throughout the run ; 2 points per kilom. for speed over 30 kiloms. per hour on a hill climb of 5 to 8 per cent. during the run ; 1 point per kilom. for speed above 70 kiloms. per hour on a flat kilometre speed trial during the run. Comfort, 0 to 5 points ; appearance, 0 to 5 points ; silence, 0 to 5 points ; ease of handling and accessibility of parts, 0 to 5 points. For the cars another coefficient was introduced of 1 point per minute of stoppage through breakdowns due to any causes other than tyre troubles.

The course each day was triangular, through exquisite country, with Tour as a starting-point. On the first day a speed kilometre on a private road was included in the programme, and on the second a hill climb. The weather, although cold and windy, was very fine. Eighteen cars and two motor bicycles took part in the contest.

The three best speed kilometre times were Brouhot (8) 59·16 secs. ; Darracq (17) 1 min. 1·66 secs. ; Renault (15) 1 min. 5·62 secs.

The chief times for the hill climb over a distance of half a kilometre were Darracq (17) 55⅗ secs. ; Brouhot (8) 59⅕ secs. ; Richard-Brazier (12) 59⅗ secs.

The general results are given in our table, the new (1904) type of Richard-Brazier car, driven by Count Walewski, carrying off the first prize, the second falling to the 4-cylinder Renault, a 20-h.p. Brouhot securing third place. The C.G.V. car (No. 22) was driven by Mdme. Knowles, who made the highest average speed for the entire run. In addition the chief special prizes have been awarded as follows :—

Renault (No. 15) *La France Automobile* medal for silence.

Brouhot (No. 8) A.C. de F. medal for the speed kilometre, and the Société d'Agriculture medal for the first car using alcohol fuel.

Darracq (No. 17) for the hill climb.

Ader (No. 20) medal for minimum consumption.

C.G.V. (No. 22), driven by Mme. Knowles, the medal for comfort.

Brouhot (No. 4) the A.C.F. medal for low consumption.

Results for the Two Days.

Classing.	Make and horse-power.	Official No.	Fuel per kilom.	Average Speed per hour.	Points.	Price in francs.	Weight in kilogs.	Passengers.
	h.p.		litres.	kiloms.				
1	14 Richard-Brazier	12	·019	49 040	73·28	16,000	892	4
2	14 Renault ...	15	·015	47 150	75·54	14,000	965	4
3	20 Brouhot ...	8	·019	52 950	78·24	18,000	1,165	4
4	20 Darracq ...	17	·022	51 680	81·63	9,500	850	4
5	16 Delaugère ...	10	·215	49 650	85·65	12,000	1,469	6
6	15 Brouhot* ...	2	·0248	39 150	96·75	11,200	1,026	5
7	8 Delahaye ...	21	·0129	35 360	99·01	6,000	634	4
8	12 Delahaye ...	11	·016	44 970	102·74	9,500	858	4
9	10 Brouhot ...	3	·0167	39 190	103·63	8,600	1,016	4
10	8 Ader	20	·0128	37 320	104·57	6,200	710	4
11	15 C.G.V. ...	22	·025	52 040	114·07	20,000	1,307	4
12	16 Darracq ..	16	·015	38 470	115·21	8,050	755	4
13	16 Brouhot ...	4	·0129	33 090	121·83	11,200	945	4
14	6½ Prunel	19	·022	31 030	124·32	3,800	625	4
15	12 Delahaye ...	14	·017	41 320	128·21	9,500	864	4
16	20 Sage	13	·018	33 180	157·37	13,500	1,210	5
		Motor Bicycles.						
1	2 Bruneau ...	51	·10	39 540	85·02	950	53	—
2	2 F. N. Herstall	55	·183	42 940	92·38	950	53	—

* Alcohol.

The trial of Head lights, also organised by the Rhone Club, took place at the same time as the Tourist car trial. There were 11 entries in this competition, and the power of the lights was tested by special apparatus. The awards, which we now give, were based upon the prime cost, the cost per hour of supplying the light, the time of burning without recharging, the intensity of the light, the ease of recharging, lighting, and cleaning, and the size and the weight of the lamp.

1st Prize.—MM. Boas, Rodrigue & Co., Alpha lamp. Price, 300 fr. ; gave light for 5 hours with 800 grammes carbide. Light effective at 114 metres when travelling ; when standing, 50 metres.

2nd Prize.—Resna Zanardini (of Milan). Price, 200 fr. ; duration 6 hours with 380 grammes carbide. Travelling, 77 metres ; standing, 60 metres.

3rd Prize.—Ducellier. Price, 122 fr. Duration 6 hours with 380 grammes carbide. Travelling, 59 metres ; standing, 60 metres.

Belgian National Circuit.—The rules governing the Belgian National Circuit, which is practically a "selling" trial, taking place from May 9th to 14th, are, in the main, based upon the rules governing the last English Reliability Trial. In details some differences are noticeable. The Circuit will be one of endurance, not speed.

There will be 10 categories according to the selling price of the chassis, viz., 1, up to 3,000 francs ; 2, 5,000 francs ; 3, 7,000 francs ; 4, 9,000 francs ; 5, 12,000 francs ; 6, 15,000 francs ; 7, 20,000 ; 8, wagons carrying a load of 1,000 kilogs. ; 9, 2,500 kilogs. ; 10, 5,000 kilogs. Only three vehicles of the same class can be entered by each agent.

Any class in which there are not three entries will be included in the next nearest class.

For vehicles weighing more than 1,250 kilogs. a special class will be provided based upon the cubic capacity of the cylinders. Entries at single fees will close on the 30th instant, after which they will be doubled.

Observers will accompany each vehicle, and as far as possible take charge of a different car each day. No assistance will be allowed to be given by the observer except on two-seated cars, when he may assist in replacing tyres if requested. Excessive speeds will be penalised, and changing of parts will not be allowed. The daily points will be 300, one being deducted for every minute stoppage except for various compulsory stops and tyre troubles. The speed allowed will be between 25 and 30 kiloms. per hour, and special points will be allotted for the hill climb and the kilometre course. For the hill climb there will be two points per average kilometre of speed ; for the kilometre one point per kilometre beyond a speed of 30 kiloms. per hour. 25 points are allotted to the brake tests, which will take place at Namur. All cars must carry their full complement of passengers, and the seating arrangements must be that of the ordinary cars sold to the public. The same driver must drive throughout the tour, and only one mechanician per car will be allowed. In making the awards the following points will be taken into consideration :—Regularity of running, hill-climbing powers, speed over the kilometre, and power of brakes. Certificates will not be given to cars which do not show an average of 25 kiloms. per hour throughout the run. The cars will be sent off at intervals of half a minute, and no repairs will be permitted except under penalisation. One hour in the morning will be allowed for washing, &c.

Competitors must undertake to supply, at the price at which their car is entered, at least three similar vehicles, if ordered before June 1st. Three months are allowed after the date of order for delivering the first vehicle, and for each subsequent vehicle further intervals of fifteen days up to a maximum of ten vehicles.

The itinerary will be May 9th, start at 9 a.m. from the Brussels Parc du Cinquantenaire to Antwerp, *viâ* Malines ; May 10th, Antwerp to Liége ; 11th, Liége-Arlon ; 12th, Arlon-Namur ; 13th, Kilometre Speed Trial at Namur on the Lives-Brumagne Road and test on the Citadelle Hill ; 14th, Namur-Brussels.

Standards for motor cycle racing machines :—It has been decided by the Motor Cycle Committee of the Automobile Club that racing machines shall be classed as follows : Class 1.—Machines weighing up to and including 70 lbs. Class 2.—114 lbs. Class 3.—176 lbs. These weights to include everything with the exception of petrol and lubricating oil. In the case of water-cooled engines the water must be included in the weight.

Motor Cycle Track Record.—On Wednesday, on the Canning Town track, H. Martin, of the Croydon Motor Club, rode eleven miles in 14 mins. 36⅕ secs., and twelve miles in 15 mins. 58 secs. from a standing start.

June is the probable date of the Automobile Club Motor Cycle annual races to be held at the Crystal Palace.

The Belgian Automobile 12 days' Salon, for 1904, is announced to be held from January 23rd to February 4th at the Brussels Palais du Cinquantenaire.

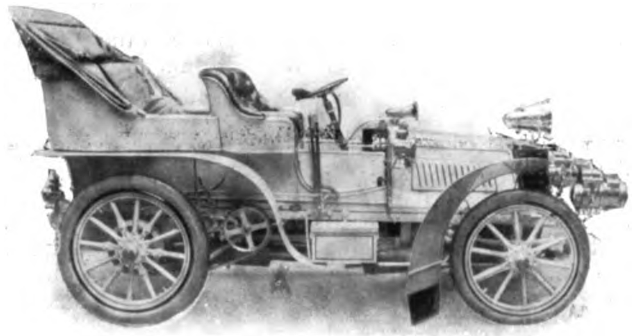
A hill climb from Pontassieve to Consuma has been arranged for June 11th by the Florence Automobile Club. The distance is 25 kiloms., giving a rise of nearly 1,000 metres.

The judges for the Automobile Club 1,000 miles trial in September are: Mr. W. Worby Beaumont, M. Inst. C.E., Professor C. Vernon Boys, F.R.S., Lieut.-Col. H. C. L. Holden, R.A., F.R.S., Mr. Lyons Sampson, M.I.Mech.E., Major F. Lindsay Lloyd, R.E., Professor Hele-Shaw, LL.D., F.R.S., Col. R. E. Crompton, C.B., R.E., the Hon. J. Scott Montagu, M.P., Mr. Dugald Clerk, M.Inst.C.E., and Mr. E. H. Cozens-Hardy, A.M.I.E.E.

The Vienna automobile week, provisionally announced to take place in May or June, has now been definitely fixed for September 6th to 13th. The Austrian International "Circuit," under the auspices of the Austrian Automobile Club, will be run on September 6th, the Pœtting Cup September 7th, and the Semmering Hill Climb on September 13th. The events will include a competition for voiturettes selling at under 3,000 Austrian crowns. One of the conditions will be that two months before the trial a subscription will be opened for all those entering to purchase a vehicle of the winning type, and the race will not be held unless 25 entries are received.

The clashing of dates in the various important Continental automobile events is leading to considerable anxiety in regard to the successful holding of the different contests. The Rhône Automobile Club is not unnaturally incensed at the dates of June 20th and 21st being selected by the Belgian Club for the Circuit des Ardennes, these two dates falling in their Aix-les-Bains week. The Rhône Club have made an unsuccessful appeal to their Belgian cousins to alter their date, pointing out that they announced definitely the holding of their meeting as far back as December last. The Rhône Club's suggestion that the Ardennes have entirely free dates from July 15th to the end of September to select from has brought about a protest from the Chambre Syndicale de l'Automobile, who ask that their little Circuit de l'Argonne, fixed for July 19th, should not be entirely ignored. Considering how many of these events are largely dependent upon the same group of automobilists, it seems a grave mistake that some sort of mutual understanding cannot be arrived at in fixing the dates of the different trials and races.

The Continental Caoutchouc and Gutta Percha Company announce that they are now manufacturing a motor cycle tyre fitted with a very effective non-slipping device. These tyres, like their motor car tyres, are sold by the Clipper Pneumatic Tyre Company, Limited, of Coventry and London.



Mr. John R. Hargreaves' new 20-h.p. Napier Touring Car. This vehicle has been specially built for speed, as Mr. Hargreaves intends to use it mainly on the Continent and largely in hilly districts. Although it is capable of attaining close upon a mile a minute, and therefore not suitable for use in this country, it is practically as easy to use as an ordinary 12-h.p. Napier. It has the regulation four speeds and is practically made under the same specifications as the 12 and 16-h.p. models.

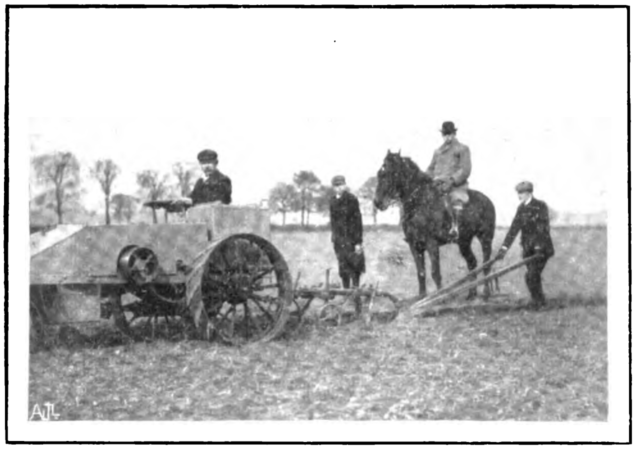
The exact number of vehicles entered for Paris-Madrid up to the closing of the lists for single entry fees on the 15th was 278, the latest entries including Lord Carnarvon, with the 1902 Gordon-Bennett Napier car, Mr. Harvey Foster, Mr. Arthur du Cros, two Bat, two Humber, and two Ormonde motor bicycles. Double fees will now be exacted up to the 15th of next month, when the entries finally close. Under the various classes there are entered 107 heavy cars, 62 light cars, 48 voiturettes, and 61 motor bicycles, representing entrance fees amounting to over 73,000 francs. The number of bicyclists required to assist as "pilots" to the cars through the various neutralised portions of the route will amount to over 5,000.

At the Baden-Baden run of the Rheinischer Automobile Club, of Mannheim, one of the new 4-cylinder Benz cars, driven by Mr. Richard Benz, took part.

Silver Bowl and Vases presented to Mr. Frederick R. Simms, President of the Society of Motor Manufacturers, by the members of the Society upon the occasion of Mr. Simms's marriage, which takes place on Wednesday next.

AN IVEL AGRICULTURAL MOTOR AT WORK.

THE accompanying illustration shows one of the latest Ivel motors at work on a farm. We have already given a description of this useful machine, and are glad to learn that the manufacturers have received encouraging support from many farmers in the country. The machine shown is the 8-h.p. model, which is provided with a twin-cylinder horizontal petrol motor, developing about 10-b.h.p. It has one speed provided, by gearing, for each direction of travel, and the mechanism employed is both simple and effective, the power being transmitted to an intermediate countershaft by a silent chain, and from it to the rear axle by a large roller chain.



As we have previously pointed out, motors such as these should prove invaluable for the numerous purposes for which the "Ivel" is constructed, and it would appear as though one or more of them would be a necessity on any large farm if it is conducted on anything like up-to-date principles. One great advantage in its favour is that it can be utilised all the year round, because when it is not ploughing, reaping, mowing, or otherwise used as a tractor, whether in the fields or on the road, it can be employed as a stationary motor for driving such machinery as chaff-cutters, grinding mills, pumps, or dynamos. The machine has been put upon the market at the price of £300 by the Ivel Agricultural Motors (Limited), whose offices are at 45, Great Marlborough Street, W.

THE Scottish Motor Manufacturers' and Traders' Association has been formally founded at Edinburgh. Mr. John Stirling has been elected President, Mr. J. H. Paterson (of Aberdeen) Vice-President, and the members of the Executive Committee are Messrs. Prosser (Rennie and Prosser, Limited), W. L. Sleigh (Scottish Automobile Company), A. K. Dempster (of Edinburgh), Peacock (Glasgow Motor Car Company), John Love (of Kirkcaldy), W. H. Kingsburgh (V. R. Agencies, Glasgow), and Wm. McLean (Glasgow). The Secretary and Treasurer is Mr. T. M. Sleigh (Rossleigh Cycle and Motor Company), of 1, York Buildings, Edinburgh. The object of the Association is to protect the interests of the trade and particularly to see that only *bonâ-fide* motor car manufacturers and agents are admitted to the benefits of the Association. Mr. Stirling, the President, remarked that the Association would tend to wipe out those people who considered themselves motor car agents because they owned a car.

THE Auto Cycle Club is being formed under the auspices of the A.C.G.B.I.

MOTOR mail carts were started this week in Norfolk between Dereham and Blakeney.

MR. JAMES A. BRODIE, the City Engineer of Liverpool, has just acquired a 10-h.p. M.M.C. car.

THE Right Hon. Lord Hastings has placed an order with Messrs. Frank F. Wellington, Limited, for a 14-h.p. Brooke car.

THE Milnes-Daimler Omnibus, which we mentioned on March 7th as being put into regular service at Hastings, has been running without a break from the start, and has proved remarkably successful.

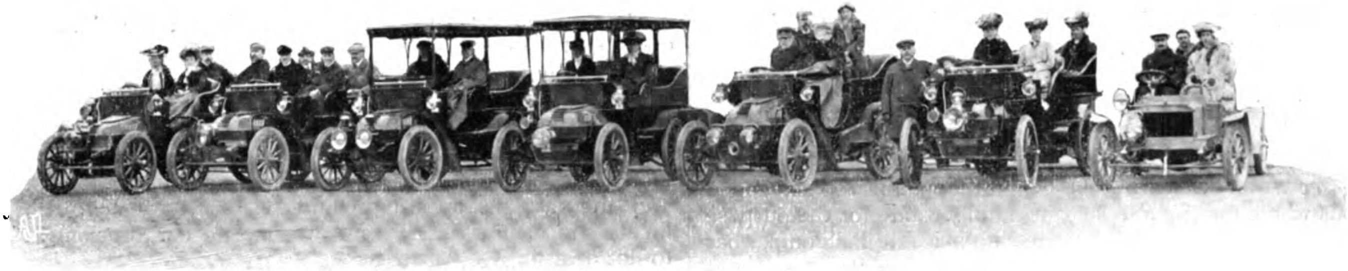
"THE Motor Car of To-day," illustrated by means of diagrams and lantern slides, was the title of a paper announced to be read by Mr. Eric W. Walford on the 24th inst. (Friday), at the City of London College Science Society.

MR. PARIS E. SINGER has accepted the Honorary Treasurership of the A.C.G.B.I., and Mr. Alfred Bird and the Hon. A. Stanley, M.P., have been appointed Trustees for the Debenture Holders. Mr. W. Worby Beaumont has been appointed Hon. Consulting Engineer to the Club.

"A HORSE which does not pass motor cars nowadays cannot be said to be quiet to drive." This is the ruling of his Honour Judge Russell, sitting at the Godalming County Court last week, in a claim brought by Mr. H. Eastwood in connection with the purchase by him of a horse which was warranted to be quiet to drive, and which subsequently showed an aversion to motor cars. In like manner on Monday at Norwich County Court, damages were awarded to a plaintiff who sued for breach of warranty of a pony because the animal shied at the electric tramcars.

MOTOR-CAR services are beginning to spring up all round the country. Commencing on the 1st of next month the Birmingham Motor Express Company will start a service of six electrically propelled 12-h.p. motor omnibuses between New Street and Hagley Road Fountain. At Stratford-on-Avon a Company has been formed upon the suggestion of the Earl of Camperdown to run steam motor-cars between that town and Shipton-on-Stour and Brailes, a distance of 14 miles. This action has been taken in consequence of the refusal of the Great Western Railway to re-open an old disused tramway covering this district.

FROM the 1903 Year Book of the A.C. of America, we gather that the Club, on February 28th, had a total membership of 418, of which 346 were active and 72 associate members. On the same date the members owned 542 motor vehicles and had 147 under order, as against 380 and 91 respectively on the same date last year. Besides the list of members, the little book, which extends to 75 pages, gives matters of interest to automobilists, and it is proposed to issue as a supplement the text of the various new automobile laws which are now pending or have been recently passed in the United States.



At the inaugural meet of the Norfolk Automobile and Launch Club held at Yarmouth on Easter Saturday, seven Brooke cars took part, including cars driven by Mr. H. Chamberlain, Mr. R. Lawrence, Mr. E. Estcourt, and Mr. Maudslay Brooke. The above photograph shows these cars, which were photographed together immediately after the conclusion of the run. Mr. Maudslay Brooke, accompanied by Mrs. Brooke, is seen on the extreme right driving the new 14-h.p. light Brooke car.

Mr. Octave Chanute, who is at present on a visit to this country, is to be entertained at dinner by the Aero Club. On Thursday he read a paper before the Aeronautical Institute and Club upon the intentions and prospects of the Aeronautical Section of the St. Louis Exposition, and upon the recent progress of aeronautics in America, particularly the experiments of the brothers Wright in gliding flight, with which we dealt some little time back in the Journal. The rules governing the great Aeronautical Contest of the St. Louis Exposition were published by us on page 19 of the current Volume. On the same evening Mr. C. H. M. A. Alderson exhibited and explained, on behalf of Mr. J. Stringfellow, parts of the original flying machine, which, in 1848, made the first recorded free flight under steam propulsion.

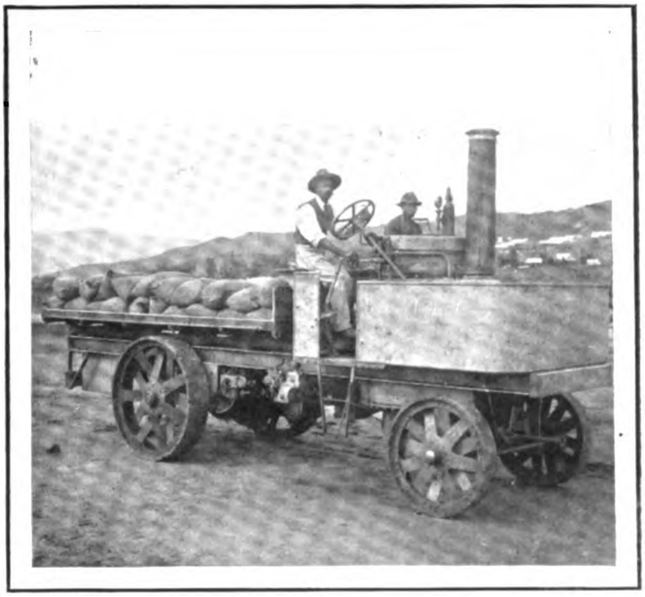
The enterprise displayed by the Society of Motor Manufacturers in taking into their hands the control of the Crystal Palace Automobile Exhibition has proved highly beneficial to the society financially. There is every probability that coming shows at the Crystal Palace will prove even more remunerative, if possible, than was the last. Considering the prosperity which may therefore be regarded as assured to the society in future, it would certainly seem advisable that they should secure their own premises, where members can at least meet for purposes of discussion and making appointments under more pleasant conditions than prevail at present. Holding frequent meetings for a variety of different purposes, at first one hotel and then another, as the society has hitherto been compelled to do, is far from convenient for the members.

"Is this free America, or are automobilists dogs?" is the terse criticism of an American contemporary, in regard to the various enactments which are being brought forward in different States to persecute and worry the American automobilist. Judging by the complaints set forth, British automobilists have something to be thankful for that they are not free Americans.

The Pope Manufacturing Company of America have acquired from the liquidator the whole of the assets and goodwill of the American Bicycle Company for 350,000 dollars, and are thereby entitled to the properties of the International Motor Car Company, the Federal Manufacturing Company, and the National Battery Company. The entire business has been engineered by Colonel Albert A. Pope.

A good-natured Baden surgeon, who had made a speciality of accident cases, has been in the habit of promoting the recovery of his patients by taking them out, sometimes several at once, in a commodious motor car, of which he is the proprietor. He has had, we understand, to abandon this good-natured form of cure owing to the attitude of the populace in the neighbourhoods through which he passed, the people refusing to be persuaded that the more or less bandaged occupants of the doctor's car were anything but victims of his carelessness whom he was now conveying home.

* * *



The above photograph shows one of the Thornycroft wagons which has been in regular use for some time by the Barberton Traction Company of South Africa. It is employed for transporting mealies, coal, dynamite and stores to the various mines in Moodie's Concession, this district being one of the worst in South Africa in respect of its roads, which may almost be said to be conspicuous by their absence. The wagon which we show carrying a load of 4 tons of gold concentrates which it has brought down from the mines to the railway, is one of the Thornycroft Company's 4-ton special Colonial type of wagon. A large number of similar vehicles have been supplied for service in India, Mauritius, and other parts of the globe.

The A.C. de France will hold their Annual General Meeting on May 9th.

Last week MM. Lebaudy made a third successful trip from Moisson with their dirigible balloon.

It is sad to learn that Count Zeppelin, who expended his whole fortune and sold his family estate for the purpose of carrying on his experiments in navigable ballooning, has been reduced in his old age by his enthusiasm to a condition of comparative indigence.

Visitors to the St. Louis World's Fair, next year, are to have the benefit of a public automobile service on a very large scale. The vehicles will be electrically propelled, and it is stated that the organisation will be on such a scale that it will be possible to transport 8,000 to 10,000 persons per hour.

The New York Automobile Trade Association is to be founded with the object of "mutual protection of its members and the public." The membership will consist of two classes—active and associate. Dealers in complete cars in and about New York will be eligible for active membership at a fee of £2 per annum. Accessory dealers, garage owners, and repairers will be admitted as associate members at £1 per annum.

In spite of rather vexatious restrictions automobilism is making rapid progress in Switzerland, and this summer it is anticipated cars will be frequently discovered at quite high altitudes in the Alps. It is not, however, we believe, strictly in accordance with facts to state, as a foreign contemporary suggests, that the monks of the celebrated Hospice of St. Bernard are making arrangements to equip their celebrated St. Bernard dogs with casks of petrol for the purpose of rescuing stranded automobilists who have run out of fuel.

Messrs. A. R. Atkey and Co. announce that they have acquired the Johannesburg Motor Mart, formerly the Johannesburg Motor Car Company, Limited. Mr. A. R. Atkey, who went out to Africa last year, will be well remembered by our readers in connection with the Nottingham Automobile Club and the Nottingham Motor Mart. Messrs. Atkey, who intend to considerably extend the scope of the Company, announce that they represent in South Africa Messrs. S. F. Edge, Limited, and the Napier carriages, the Locomobile Company of America, the Gladiator Car, and are also stocking Daimlers and make a special feature of Cudell cars. Motor accessories are receiving special attention, and the repair department is well looked after by a competent staff of mechanics. Ample storage room is available in the garage, which is open day and night. The address is Main Street and Kruis Street, Johannesburg.

An amusing automobile version of an old story comes from America. A rather speedy automobile driver, when tearing along a country district, gave warning by means of his horn to a man standing with a dog in the middle of the road. The man promptly cleared, but not so the dog, and the inevitable consequences ensued. The driver stopped promptly, and, anticipating trouble, approached the man with his pocket-book in his hand, anxious to get off paying as little as possible, and, stating that he was in a deuce of a hurry, asked him to set a price on the dog, and he would settle there and then. "Vell, goot," began the German stranger. The driver, fearing imposition, gave no time for finishing the sentence, but blurted out, "Here, be a good fellow and take that," shoving 25 dollars at him, "and call it square." Then to save money he leaped into his machine and was soon lost in a cloud of dust. Hans took a long look at the bunch of bills, the lacerated remains of the dog, and the fast disappearing cloud of dust. "Vell," he finally said, "he was a goot fellow. I vonder who pelonged to dot deat tog?"

The Simms Manufacturing Company, Limited.—The Directors' Report and Balance Sheet to December last was presented at the General Meeting on the 23rd instant (Thursday). The Profit and Loss Account showed a net balance for the year of £2,098 *17s. 11d.* The Directors in their report recommended a dividend of 5 per cent. for 1902, after making provision for depreciation, placing £1,000 to reserve, and leaving £227 *2s. 9d.* to be carried forward to the new account. The Report states that owing to the loss of orders brought about through short deliveries of motors, mainly caused by the removal of Messrs. Donkin from London to their new Chesterfield works, Messrs. Bryan Donkin and Clench, Limited, paid to the Company by way of liquidated damages £2,350, and waived their right to any dividend for the past financial year on their share holding. The current deliveries now promise satisfactory results. A frame department has been started, and the Company are now in a position to supply a complete chassis. More space is already required, and it is proposed shortly to transfer the business to larger and more suitable works in London.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Alfred Dunhill (Limited), 145 and 147, Euston Road, N.W.—Capital, £40,000 in £10 shares. Object, to adopt an agreement with A. Dunhill; to acquire the business of a manufacturer of and dealer in tarpaulins, motor clothing, &c. The first directors are A. Dunhill, W. R. Parker (managing directors), and R. H. Douglass.

London Motor Engineering Company (Limited), 87a, Wellesley Road, Gunnersbury.—Capital, £5,000 in £1 shares. Object, to carry on the business of engineers, makers and repairers of motor cars, &c.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published April 30th, 1903.

503. J. F. Walters. Internal combustion engines.
9,239. A. Craig. Motor vehicles.
9,638. L. Sterne. Engines or motors.
9,964. Albany Manufacturing Company, Limited. Condensers.
11,139. A. R. Bellamy. Electrical ignition apparatus.
12,085. I. J. Foccart. Variable speed gear.
20,142. E. Robion. Change-speed gearing.
20,743. J. F. Craig and T. V. Fleming. Rotary steam engines.

Applied for in 1903.

Published April 23rd, 1903.

582. F. Lauer. Accumulators.
1,282. J. H. W. Fitzgerald. Pneumatic tyres.
1,984. E. Braun. Clutches and variable speed gearing.
2,109. M. Bauer and H. Steinhauser. Motor cars.
2,263. F. R. Simms. Internal combustion engines.
3,446. C. H. Morgan. Explosion engines.
3,651. A. Radovanovic. Internal combustion motors using liquid fuel.

Applied for in 1903.

Published April 30th, 1903.

1,264. C. C. Riotte and C. R. Radcliffe. Internal combustion engines.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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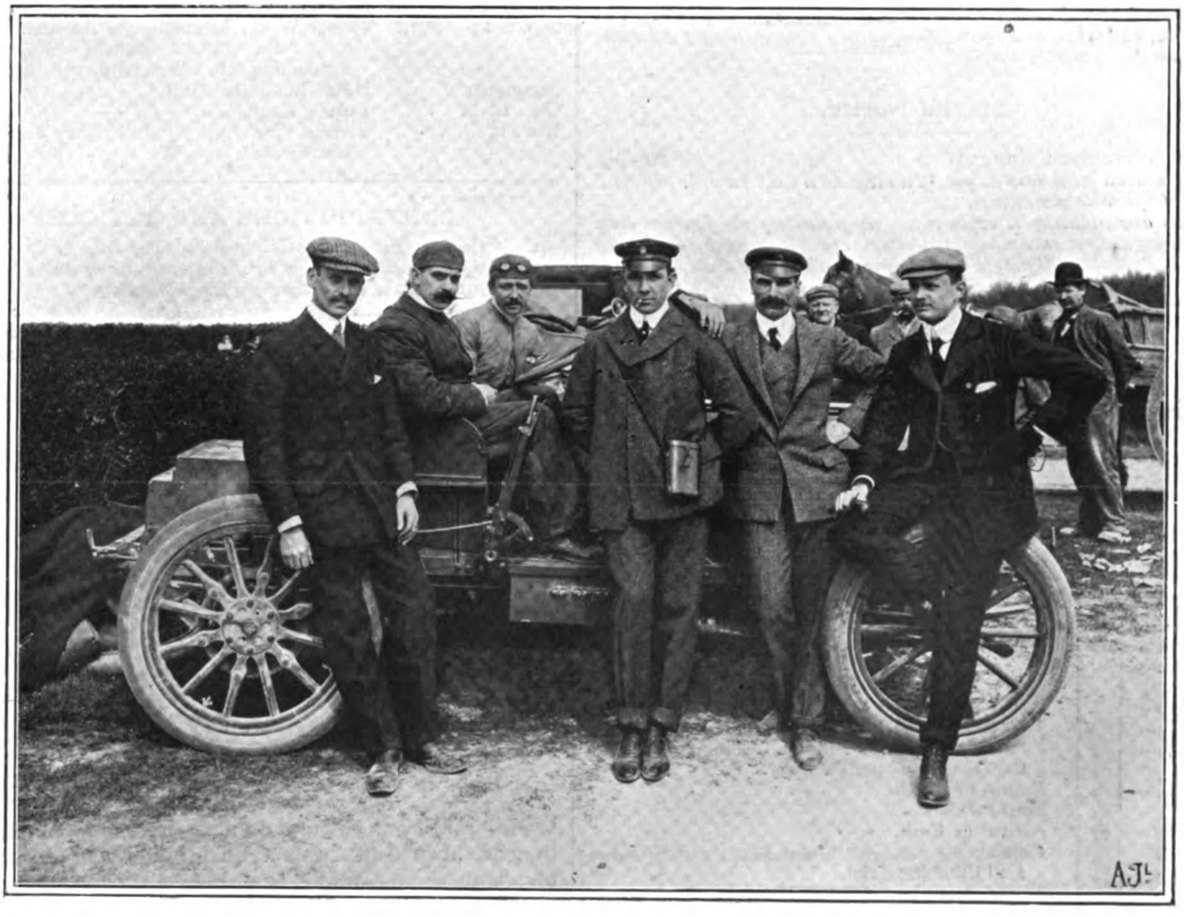

THE GORDON-BENNETT ELIMINATING TRIALS AT WELBECK.

The Drivers of the five Napier Cars—Mr. Mark Mayhew, Mr. J. W. Stocks, Mr. Charles Jarrott, Mr. S. F. Edge, and the Hon. C. S. Rolls.

THE AUTOMOTOR JOURNAL.

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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.

May 4, 11, 18 ...	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).	
May 13-14 ...	Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).	
May 16	Sheffield A.C. Hill Climb, Padley Wood.	
May 23	Scottish Auto Club Hill Climb.	
*June 13	Gymkhana at Ranelagh.	
June 20	Manchester Auto Club Hill Climb.	
July 1 ...	Exhibition at Dublin of Gordon-Bennett Cup Cars.	* The Irish Fortnight.
July 2 ...	Gordon-Bennett Race.	
July 3 ...	Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.	
July 4 ...	Speed Trials, Phœnix Park.	
July 6 ..	Tour to Newcastle and Belfast.	
July 7 ...	Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy.	
July 8 ...	Return to Dublin.	
July 9 ...	Start for Cork.	
July 10 ...	Arrival at Cork. Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.	
July 11 ...	Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.	
July 13 ...	Start of Tour through the South.	
July 14 ...	Arrival at Killarney.	
July 15 ...	Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.	
July 24-25 ...	Southport Speed Trials.	
*August 10-22 ...	Tourist Motor Bicycle Reliability Trial.	
*September ...	The 1,000 Miles Trial.	
1904.		
...	*Light Van Trials.	
*Feb. 12-24 ...	Crystal Palace Exhibition.	

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.

May 9-14 ...	Belgian National "Circuit."
May 14	Paris-Madrid. Start of Tourist Section.
May 16-24 ...	Stockholm Exhibition.
May 18	Speed kilom.—Geneva (Swiss A. C.).
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries unti May 15. Double fees April 16 to May 15.
May 25-30 ...	Hanover Alcohol Van Trials (German Agricultural Society).
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-28 ...	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21 ...	Circuit des Ardennes.
June 28	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16 ...	Race Trelex-Saint-Cergves (Swiss A. C.).
Sep. 6-13 ...	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September ...	Udine Exhibition (Italy).
Oct. 15-21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to The Editor of "The Automotor Journal," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

THE PRESENT POSITION OF THE LEGISLATIVE PROBLEM.

When railway accidents used to be more frequent than they are at present it was frequently asserted that the taking of adequate precautions would never be enforced upon the railway companies till a Cabinet Minister was involved in an accident. These remarks may not appear particularly relevant to the subject of automobilism, but the fact that to all intents and purposes the Prime Minister of England has been for the second time practically a defendant on the usual charge of exceeding the speed limit, gives them both point and appositeness at the present moment. We may hope that the occurrences will have an indirect but not the less powerful effect in stimulating reform. The misfortune of the Prime Minister, or his driver, could scarcely have occurred at a more opportune moment. The Committee of the Automobile Club is arranging to take the votes of all its members and also of members of the affiliated clubs throughout Great Britain and Ireland and the Motor Union on the pressing question of legislative reform. Practically three proposals are being put before the voters. The Bill associated with the name of the Hon. John Scott Montagu, amended up to date, the alternative proposal to which Lord Russell has committed himself, and the course of letting well (or ill) alone, proposing no alteration in the law, but trusting to "the effluxion" of time and the diminution of prejudice to mitigate the rigours of its administration as they have done in the case of the Lord's Day Observance Acts and other antiquated measures.

THE present moment is therefore of extreme importance for the future of the automobile industry. The decision of the Club members and allied bodies, which practically amounts to the decision of all the automobilists of the country, cannot fail to have some effect on any legislation that is introduced, and we sincerely trust that every person to whom the voting papers are sent will carefully weigh the three alternatives, and bestow the same amount of attention on his vote as if his decision would alone determine the whole issue.

ON the occasion on which the debate on the numbering proposals was opened at the Club by Lord Russell, we freely criticised both his action and that of those who supported it. We gladly recognise Lord Russell's *bonâ fides* in putting forward a Bill drafted by himself. It is always so pleasant to adopt the position of critic towards other people's proposals without putting forward proposals of one's own, that his departure in this respect is entitled to recognition. But we are afraid that that is all the recognition which we can accord him. The prophet of old, who wished that his enemy might have written a book, would have probably had a more complete revenge could he have induced his enemy to draft a proposed Act of Parliament. The measure put forward by Lord Russell not merely seems to neglect but actually to be totally unacquainted with all that has been said and written on the subject at the Automobile Club, by the Club Committee, by the *Club Journal*, by ourselves, and others. The one point of paramount importance is that, in abolishing the speed limit as instituted by the Act of 1896, motorists shall not be rendered amenable to the earlier Highways Act of 1835, known generally as the Act of William IV. We have pointed out on a variety of occasions that the mere repeal of Section 4 of the Act of 1896 will do the automobilist no good whatever. Whether he is numbered or whether he is not numbered, the police will have him every time they like under the Act of William IV, Section 78, for driving "the same furiously so as to endanger the life or limb of any passenger." The absence of any safeguards for preventing all the troubles from which automobilists now suffer under the Act of 1896 from being re-introduced under the Act of 1835 is a fatal defect in Earl Russell's proposed Bill. It is so fatal that we need not for the present discuss the practicability of his other proposal of substituting an examination of drivers for carrying conspicuous numbers, or the suggestion that any person who refuses to stop on demand of a policeman in uniform, or when he has caused injury to another person, shall be liable to such a fine as £50, to imprisonment for three months, or to both. We have frequently pointed out that if such drastic penalties are to be permitted, independent corroboration of the police evidence is an indispensable condition.

MR. SCOTT MONTAGU'S Bill, as amended up to date, is a vastly more workmanlike production than the proposed Bill of Earl Russell. It does attempt to provide safeguards on the point to which we have above referred. The attempt it makes in this direction is a recent amendment to the original measure, viz., Section 5. In the article in which the *Club Journal* deals with the legislative question it is explicitly stated that the object of this section is to do two things—to prevent motorists from being summoned under the old Act of 1835, and to get round the decision on which we have frequently adversely commented in the case of Mayhew *v.* Sutton. There may be some doubt as to whether the proposed Section 5 will effect these ends. But at any rate it recognises the difficulty, which is a great deal more than Earl Russell's proposed Bill does. The reasons why we are doubtful on the point are the following:—In the great majority of cases that come before the police courts, in which drivers of horse-drawn vehicles are summoned under the Act of William IV. for furiously driving, the speed at which they are proceeding is seldom the main count in the charge. It is generally complicated by suggestions of not having satisfactory control of the vehicle or of endangering the life and limb of passengers. If now the new measure merely provides, as suggested, that speed alone shall not be a ground for taking proceedings irrespective of the other circumstances of the case, the police desirous of obtaining a conviction will always assert these other circumstances.

SECONDLY, the decision in Mayhew *v.* Sutton is a decision as to what now constitutes danger to life and limb, and is a ruling case deciding that there is danger to life and limb even when there are no persons on the highway excepting the automobilist and the policeman who makes the charge. Even if Section 4 of the Act of 1896 is repealed, it is quite conceivable that this may be made a precedent for putting a similar interpretation on the corresponding passage in the old Act. We suggest therefore again, as we suggested last July, the addition of a section to the Act citing the Highways Act of William IV, and explicitly stating that wherever the charge of driving furiously or to the common danger is brought against an automobilist, that common danger must be independently proved; and "independently proved" should be explained to mean by somebody other than the policeman who makes the charge. With this slight alteration or addition Mr. Scott Montagu's Bill would, in our opinion, be unexceptionable.

THERE ought to be little question, we should think, in the mind of any automobilist as to whether he would prefer to see its provisions passed into law rather than witness those which Lord Russell has incorporated in his Bill placed on the statute book. To ensure that every motor vehicle would always be in the hands of a competent driver is, of course, highly desirable. Whether the difficulties of carrying out such a scheme in practice, involving as they would do a complicated and unsatisfactory system of examination and granting certificates, is practicable is another question. The proposal cannot in any case be regarded as an alternative to providing means of identification. These are required to meet the case of the reckless and inconsiderate as distinguished from the merely incompetent driver. What the authorities require is means of identification which will enable them to trace and secure the conscienceless individual who behaves outrageously, and will not stop when called upon. It is tolerably certain that the authorities are determined to introduce means of identification. If automobilists adopt by an overwhelming majority the position that they are willing to accept identification in exchange for the abolition of the speed limit, they stand a chance of getting it. If they refuse to consider that alternative they are in serious danger of suffering the infliction of numbering, or its equivalent, without the corresponding alleviation.

THREE questions are put before the voters: Will they have Earl Russell's Bill? Will they leave things as they are? or will they have the Committee's Bill, slightly modified, perhaps, but still a measure recognising identification, and demanding the abolition of the speed limit? But there are not really three alternatives before the industry. There are, if we judge the portents aright, only two—numbering or identification with perhaps a higher speed limit, or numbering or identification with the speed limit entirely removed. The latter is to all intents and purposes the Committee's measure. To let things merely drift is to court risk of the former.

WE cannot, therefore, too strongly urge upon all our readers, and on all those who will be called upon to vote on the question, to pronounce in favour of identification, coupled with the removal of the speed limit—that is to say, in favour of the Committee's Bill. We are not in favour either of identification or numbering in themselves, and we would be very glad to escape them, but we fear we cannot escape them. Certainly not by voting either for Earl Russell's Bill or for the policy of doing nothing. Of the two evils we choose the less—numbering with no speed limit, especially if our suggested driving to the common danger clause be added—rather than allowing things to remain practically as they are with numbers imposed as well. We need not insist on the enormous importance of the question for the future of the industry. It is very possibly the alternative between progress or stagnation.

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MUNICIPAL MOTOR WAGONS.

A VERY powerful testimonial to the value of the self-propelled vehicle in what may be termed perhaps the humbler, or at any rate the less ornamental walks of life, is provided incidentally in the Report of Mr. T. W. E. Higgens, A.M.I.C.E., the Borough Surveyor of Chelsea, on "The Removal of Dust, Slop, and other Refuse." This, of course, is only what was to be expected, as Mr. Higgens may justly be regarded as one of the pioneers of the movement to apply automobilism to municipal purposes, one of the very first practical attempts in this direction in this country having been made by the Chelsea Vestry at Mr. Higgens' suggestion.

MR. HIGGENS' report is practically an elaborate comparison of the application of mechanical with the application of horse traction to the purposes in question. Concerning the sentimental views prevailing in regard to the horse, from the time of Job downwards, as Mr. Higgens says, he rightly thinks they do not come into the present problem, except from a rather different point of view, for we must look at the matter from both sides, "or, rather, look at the horse from both ends." The horses employed by the Borough of Chelsea alone, in removing refuse, deposit about three-quarters of a ton of manure in the streets in the exercise of their functions, and those which pass the Chelsea Town Hall in a single day are responsible for about fifty tons. Mr. Higgens points out that the employment of heavy motor vehicles for the transport of goods has become more generally adopted in the great towns of the north of England than in the south, and in visiting the works of manufacturers who supply this class of vehicle, for the purpose of making his report, he was not surprised to find that six out of seven of them had largely increased their works to cope with the large number of orders they have on hand.

IT was mainly in the towns of Liverpool, Burnley, Blackburn, Bradford, and Glasgow that Mr. Higgens was able to collect statistics and make observations as regards the applicability of the motor vehicle to the problem. The result of Mr. Higgens' researches goes to show that the pronounced superiority of the motor vehicle to the horse-drawn article is most shown, at any rate from the point of view of economy, when long runs with full loads form the greater portion of the work. Where a large number of stops have to be made, as in the case of dust-carts, the superiority is less marked, and to make it effective the motor dust-cart should draw a trailer, so that practically one source of motor power propels two dust-carts and employs two gangs of men. It is obvious that this contention is in accordance with what might be expected, because the proportional cost of skilled labour is increased, the interest on outlay and capital is greater, and the proportion of useful load to the total weight of the machine is less advantageous, to say nothing of fuel losses whilst the machine is at rest, and uneconomic working at light loads. The sentence in which Mr. Higgens sums up his conclusions is as follows:—"a motor which has to crawl along from door to door for dusting, or from heap to heap for slopping, is being used in the most unprofitable manner possible; whereas a motor used for street watering, where it can be kept running most of its time, or for general cartage, is a useful and desirable addition to a municipal plant."

AFTER carefully considering the problem from all points of view, and making careful estimations of the probable cost involved, Mr. Higgens recommends his Corporation to purchase six motors with trailers for dust collection, and suggests that two gangs of men should work with each motor-van and trailer, carts being hired for times of exceptional pressure.

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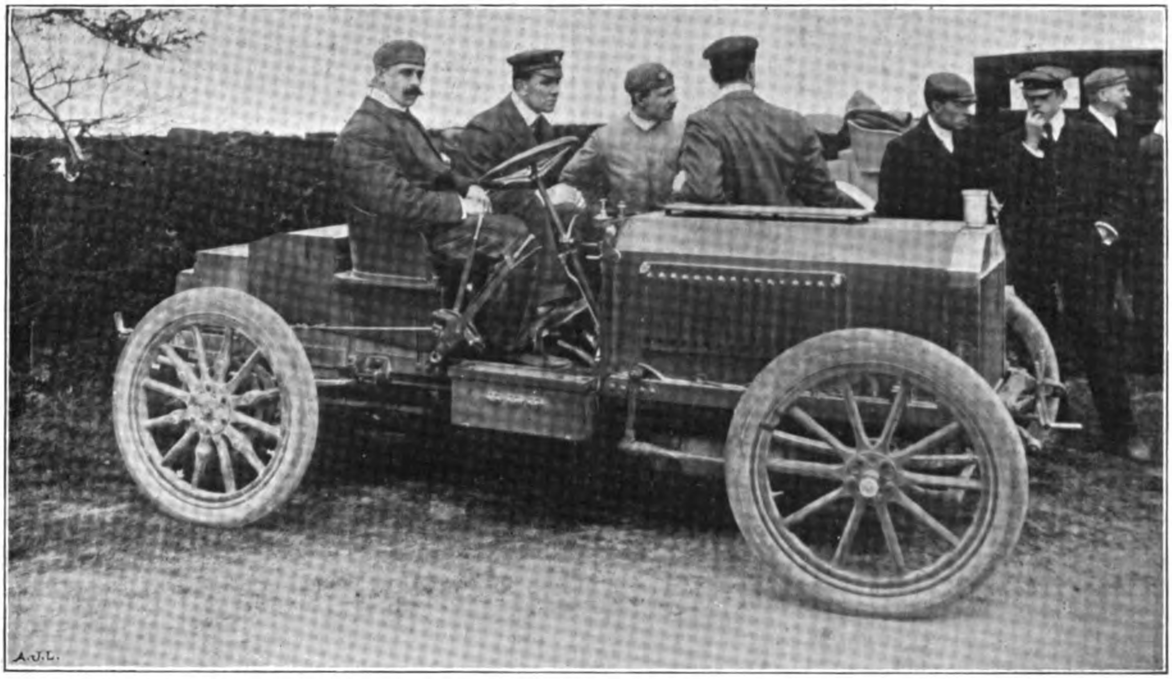
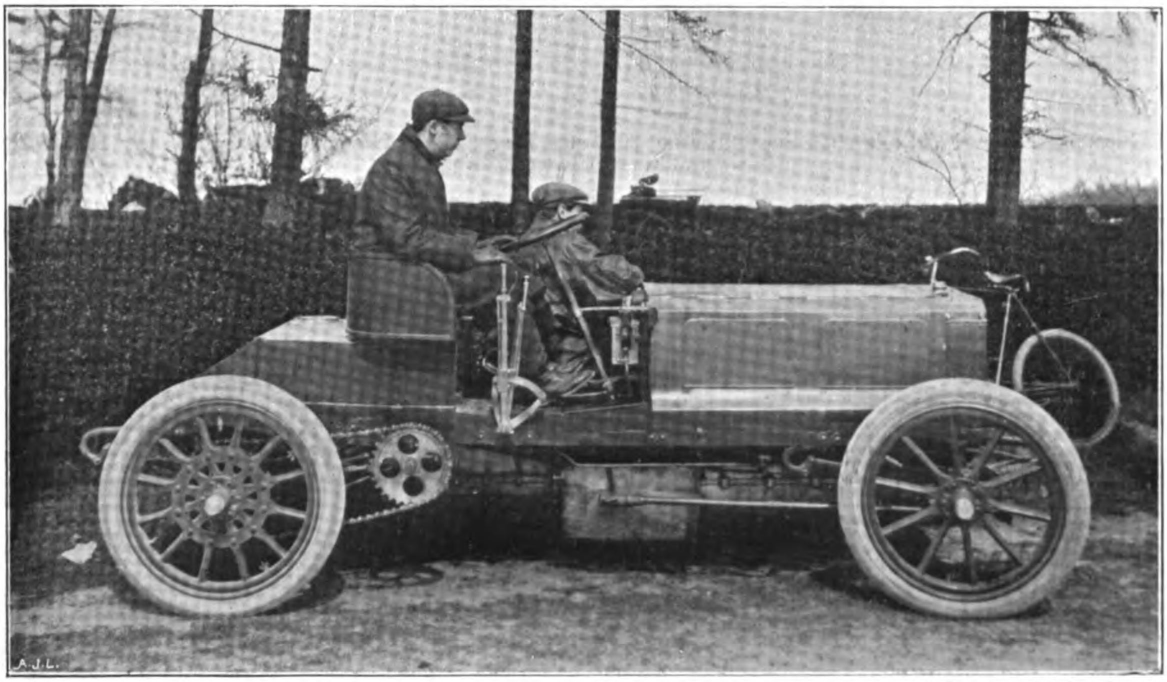
SIMILAR valuable testimony to the excellent work which the motor dust-cart is capable of performing is furnished by Mr. Arthur Ventris, formerly Surveyor to the old District Board of Works to the Strand, and now Assistant Surveyor and Engineer of the City of Westminster. In the Strand district, motor vans with trailers are used for dust collection, as recommended by Mr. Higgens in his report, both van and trailer having a capacity of six cubic yards each. Their employment since they were first adopted has, according to Mr. Ventris, been an unqualified success. An interesting feature of the scheme is that each of the dust-carts is adapted to be transformed almost instantaneously into a water-cart of a capacity of 750 gallons. When a motor dust-cart has finished its morning round, it is run into the yard, the dust-cart body lifted off the chassis by means of a crane, and replaced by the water-cart body. The vehicle then goes out watering the streets with a much heavier load of water and at much greater speed than any horse could tackle

THE GORDON-BENNETT CUP ELIMINATING TRIALS.



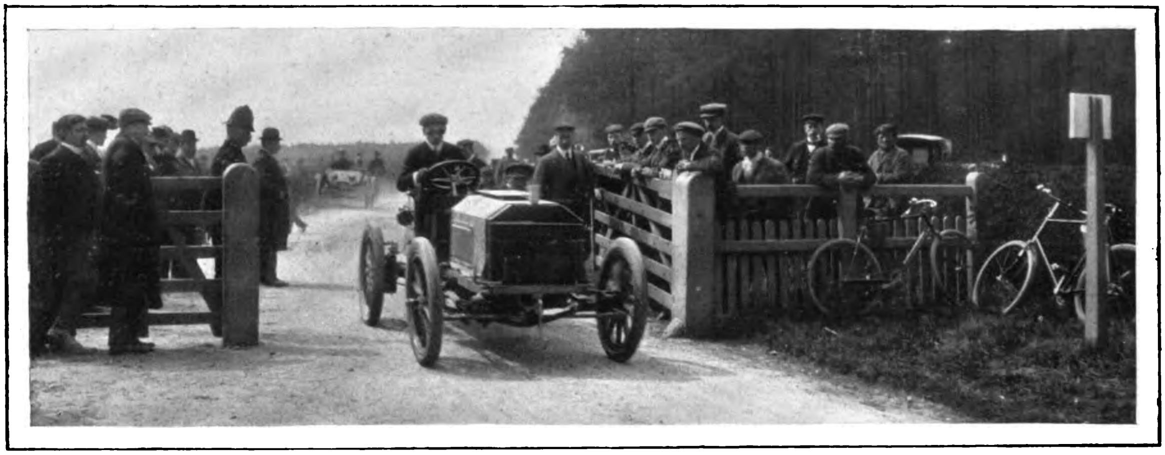
Mr. J. Stocks on one of the Napiers prepared for his call, outside the Clipstone Gate, with Mr. C. Jarrott by his side, and Mr. S. F Edge leaning on the car.

ALMOST for the first time, at any important fixture in connection with the Automobile Club, perfect weather was experienced last Saturday, when the first portion of the Eliminating Trials took place, by permission of the Duke of Portland, on the Clipstone Road, at Welbeck, to determine which car should be the third to represent Great

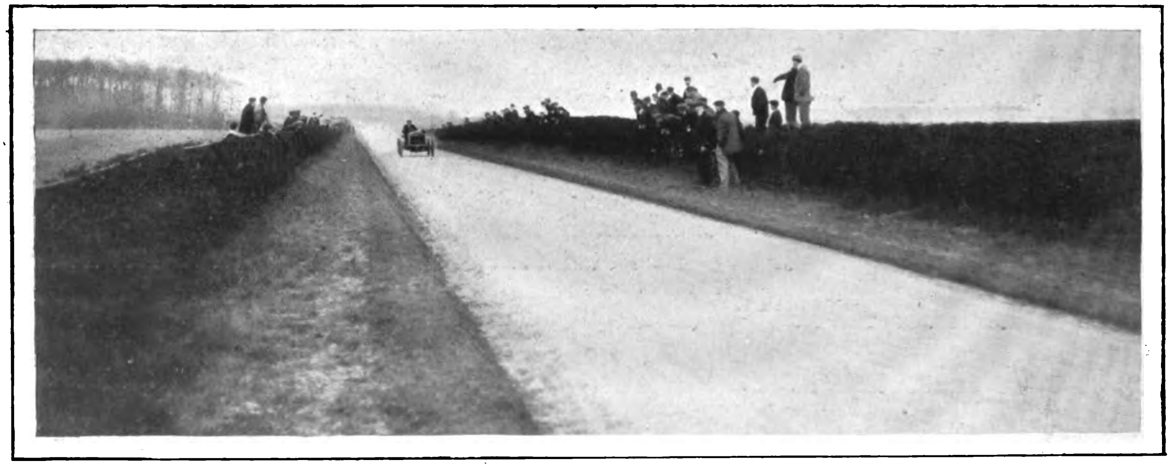


Mr. J. Lisle, junr., on the Star Car waiting his turn before the start.

Outside Clipstone Gate. Final adjustments before the start.



The Clipstone Gate entrance to the Course, where the actual start for the flying kilometre was made. Mr. Mark Mayhew waiting for the word "Go."



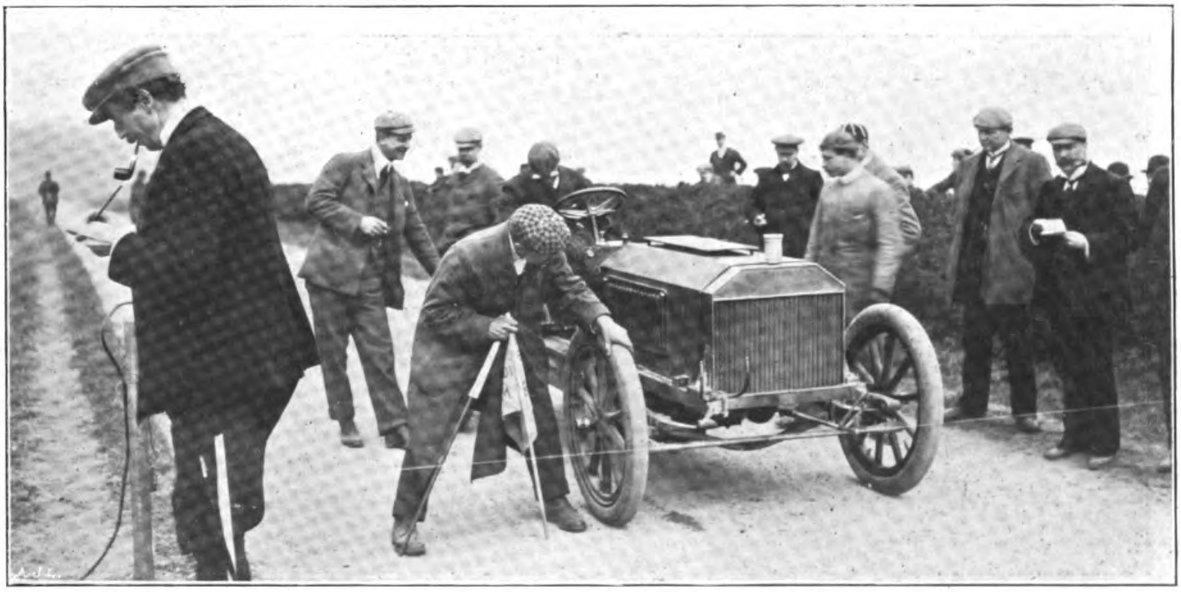
Coming up to the end of the mile towards Clipstone Gate.

The Star Racer dropping down the last few yard of the inclined portion of the Course.

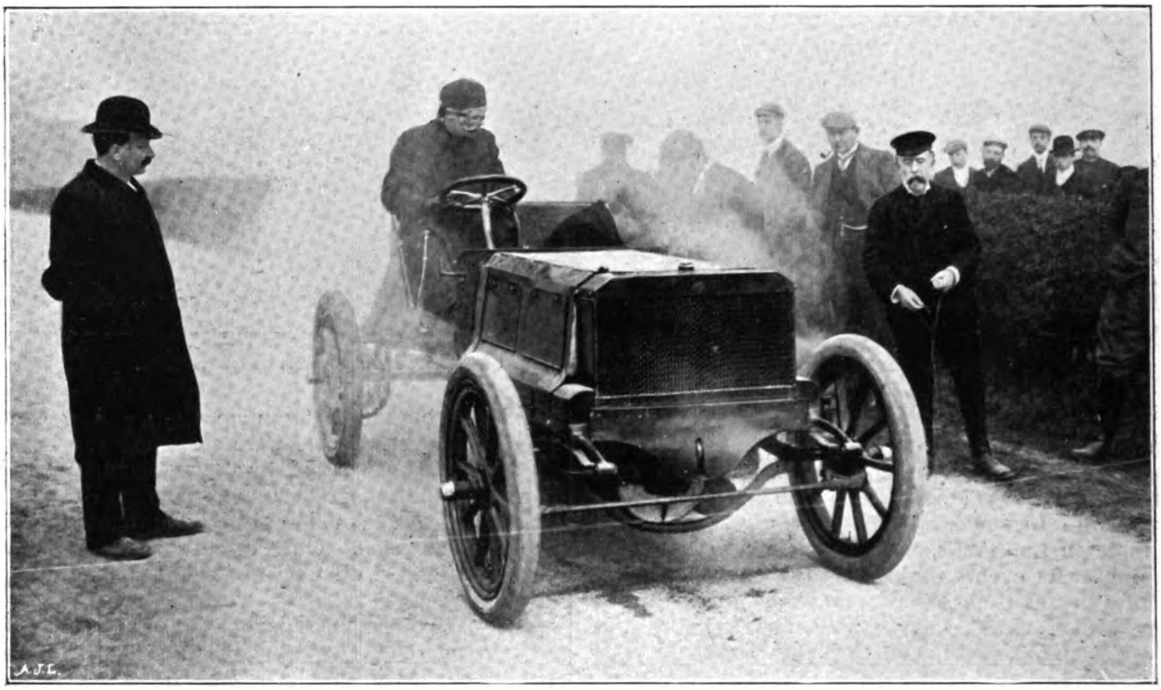
Britain in attempting to keep the Cup. For the coveted position of running jointly with Mr. S. F. Edge and Mr. Charles Jarrott (on Napier cars), there were two competitors viz., S. F. Edge (Limited), and the Star Engineering Company, who together brought four cars, the former having three in the Trials, and the latter relying on one vehicle only. As events turned out the entire team will consist of vehicles from the Napier works, driven respectively by Messrs. S. F. Edge, Charles Jarrott, and J. S. Stocks. The Hon. C. S. Rolls and Mr. Mark Mayhew unsuccessfully disputed with Mr. Stocks the honour of driving the third Napier car.

Opinions—expert and otherwise—differed very materially as to the speeds at which the various cars were travelling. We heard it variously computed at from 40 up to 80 miles per hour. For obvious reasons the speeds attained will not be divulged by the Club. Those who have seen racing cars travelling at full speed, know how utterly impossible it is to estimate their pace by mere observation, but personally we had little doubt that Mr. Stocks' Napier was travelling fastest. That our judgment was correct is fully borne out by the comparative figures published by the Automobile Club. A general feeling prevailed that the cars were travelling slowly. The expression was only used by way of comparison, but what a remarkable commentary this is upon the extraordinary progress which has taken place in automobile speed within the last few years. Only three years ago many who on Saturday looked on with almost cynical contempt at the so-called "slow speeds" would have held their breath with awe had they been within 20 yards of a car passing at the rate at which the Gordon-Bennett racers speeded past. And going back to 1894, when the average pace of 13 miles an hour over an extended journey was voted as being tantamount to committing suicide, makes it difficult to realise how average speeds of 56 miles an hour over long distances can now be viewed with the calmness which prompted such expressions as were heard on Saturday—"no fast times at all."

Mr. Stocks throughout drove superbly. His car took a course as straight as an arrow, whilst with some of his competitors considerable wobbling was at times observable. Mr. Rolls was unfortunate in one respect, as he had to contend with a faulty valve. On the whole, however, we



The Standing Mile.—Start from the lower end of the Course. Mr. Stocks getting his car up to the "tape." Mr. Julian Orde, the Club General Secretary, is seen on the left making official notes, and Mr. J. E. Hutton, in the centre, at the back, has a moment's rest from his duties at the telephone.



Mr. J. Lisle, junr., at the tape one second before his start for the Standing Mile on the up-grade. Mr. Lisle, senr., is standing to the left and Mr. Lyons Sampson to the right in the picture.

think that the final choice which—as the results of the speed tests at Welbeck on Saturday, and of the subsequent hill-climbing tests at Dashwood Hill on Monday morning—has fallen on Mr. Stocks, is thoroughly justified, and that the Automobile Club are fortunate in having such a splendid reserve of other drivers as the Hon. C. S. Rolls and Mr. Mark Mayhew, with Napier cars, Mr. J. Lisle, junior, on the Star Company's racer, and Lieut. Mansfield Smith-Cumming on his business-like and powerful Wolseley car.

Arrivals at the Nottingham headquarters of the Automobile Club, the Victoria Station Hotel, began on the Thursday, and continued during all Friday—even throughout that night automobilists continued to arrive. The racing cars and their drivers were located at Mansfield, about three miles from the course, and were not, therefore, visible till the Saturday. For the early arrivals on Friday, entertainment had been provided by the Nottingham Automobile Club in the form of a supper and smoking concert at the "Black Boy" Hotel.

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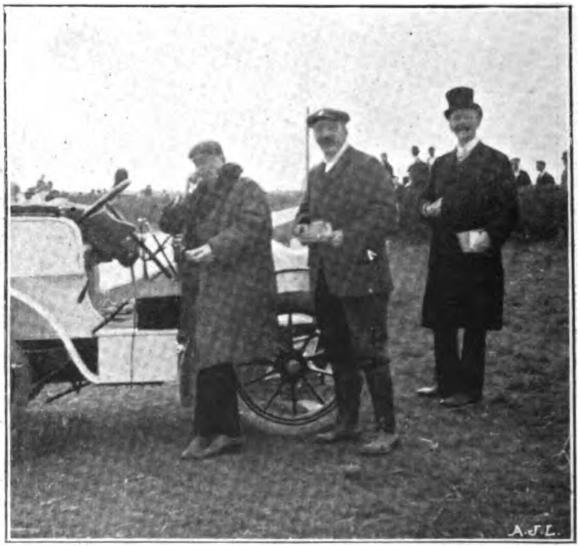


2.

1.—Watch Synchronising.

2.—The electrical timing apparatus.—Combining business with pleasure. Mr. Henry Edmunds divides a pork pie with Mr. Scott Montagu and other helpers.

At the finish of the Kilometre.—A Back View. Messrs. J. Lisle, C. E. Shaw, M.P., Harvey Du Cros, junr., S. F. Edge, H. Norman, M.P., J. Ochs, J. Scott-Montagu, C. Jarrott, Basil Joy, Lord Kingsburgh, Cornwallis West, and Rupert Beckett.

Most of the cars on the Saturday morning were in good time, and by 10.30 a.m., when the gates were closed against all vehicles arriving later, quite 150 motor cars must have taken up their position in the fields bordering the course, whilst the number of visitors themselves must have approximated to about 4,000. Mr. E. M. C. Instone's 22-h.p. Daimler was one of the first arrivals at the course, bringing the Club General Secretary, Mr. Julian Orde, and the Editor of THE AUTOMOTOR JOURNAL. In spite of a burst inner tube, only a couple of the new Mercedes cars were able to out-distance this fine vehicle on the way to the course. Rather than let the Club Secretary be late, Mr. Instone ran a great part of the distance with the tyre down, the inner tube being almost unrecognisable when the car pulled up on the course. Mr. Claude Johnson, together with Colonel Holden and the Rt. Hon. Sir John H. A. Macdonald, was accommodated on Mr. J. E. Hutton's new Mercedes car, and the delightful running of this vehicle was very striking. One by one, after the Clipstone gate had been closed at 10.30, cars continued to arrive, but were doomed to disappointment. The occupants consequently had to leave their vehicles in the road and witness the day's performance on foot. Lieut. Mansfield Smith-Cumming put in an appearance at about 11.15,

And a Front View at the same spot.

Mr. Instone's 22-h.p. Daimler. Our sixth inner tube in three days.

Watching the visitors arrive.

his car being apparently in excellent condition. Had the Club seen its way to relaxing its stringent regulations sufficiently to allow him to make an unofficial run over the course after the conclusion of the trials, we feel sure he would have met with an enthusiastic ovation.

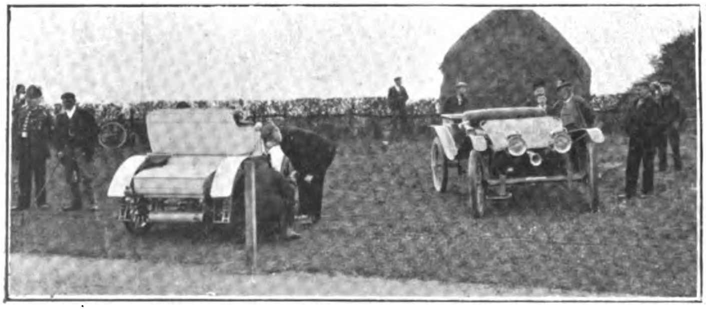
Some delay was experienced in getting the track fully flagged and the police into position for keeping off the public and signalling, and it was not till nearly 11.30 that a call was made for the first car to start, when Mr. Rolls took the lead, followed by Mr. Stocks, Mr. Mark Mayhew and Mr. L. Lisle, junior, this order being only once varied throughout the entire series of trials, when Mr. Rolls followed Mr. Stocks.

Each car made altogether 12 distinct runs, viz., 3 runs down hill over the flying kilometre, 3 runs up hill over the flying kilometre, 3 runs down hill over the standing mile and 3 runs up hill over the standing mile. The Eliminating Trials were completed on Monday morning, when the cars ran three times up Dashwood Hill. The one disappointing feature of the day was that no official times were published, so that everybody was quite in the dark in regard to the actual speeds attained, but the Racing Committee had very good reasons for their procedure, and the system adopted both in the speed trials and the hill climbs in giving comparative results is to be greatly approved under the circumstances.

As a result of the shortness of the course, the hedges were in many places black with onlookers, and the view along them was remarkable; bicycles were stacked thickly down most of the hedges dividing the fields. In place of the Derby dog, an amusing diversion was created by a motor rabbit, which was wildly urged on by the onlookers lining the hedges in its apparent endeavours to "pace" one of the Napier racers.

An enormous number of prominent automobilists were present, but it is practically impossible to enumerate them. Amongst many notable spectators were the Duke and Duchess of Portland, Sir Francis Jeune, Sir John Macdonald, Sir Hickman Bacon, Bart., the Hon. John Scott-Montagu, M.P., Mr. Carew, M.P., High Sheriff of County Kildare, Mr. C. E. Shaw, M.P., Mr. Henry Norman, M.P., and Mr. Warner Turner, the agent of the Duke of Portland. A special contingent from the Yorkshire Automobile Club, headed by Mr. Alfred Dougill, the Hon. Secretary, had driven over *viâ* Doncaster and Worksop.

The timing arrangements were admirably carried out both by watch timing and by means of Mr. R. E. Phillips' electrical timing apparatus, which he had specially installed for these trials. The electrical apparatus was worked from Mr. Phillips' Rochet-Schneider car, Mr. Bird and Mr. Scott Montagu assisting. The watch timing was at the Clipstone end of the course in the hands of Mr. A. J. Wilson, Mr. H. H. Griffin, and Mr. Woollen, Mr. Basil Joy having the general control there. At the lower end of the course, Mr. J. H. Swindley and Mr. Straight were timing by watch, Mr. Lyons Sampson having charge of the electrical apparatus, and Mr. Hutton officiating at the telephone, the Club Secretary, Mr. Julian



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1.—Mr. R. E. Phillips' car fitted with the electrical timing apparatus, with Mr. Phillips and Mr. Basil Joy taking observations. On the right is a Lanchester car used for running up and down the Course by Mr. Claude Johnson and the officials.
2.—A view of the car "enclosure."

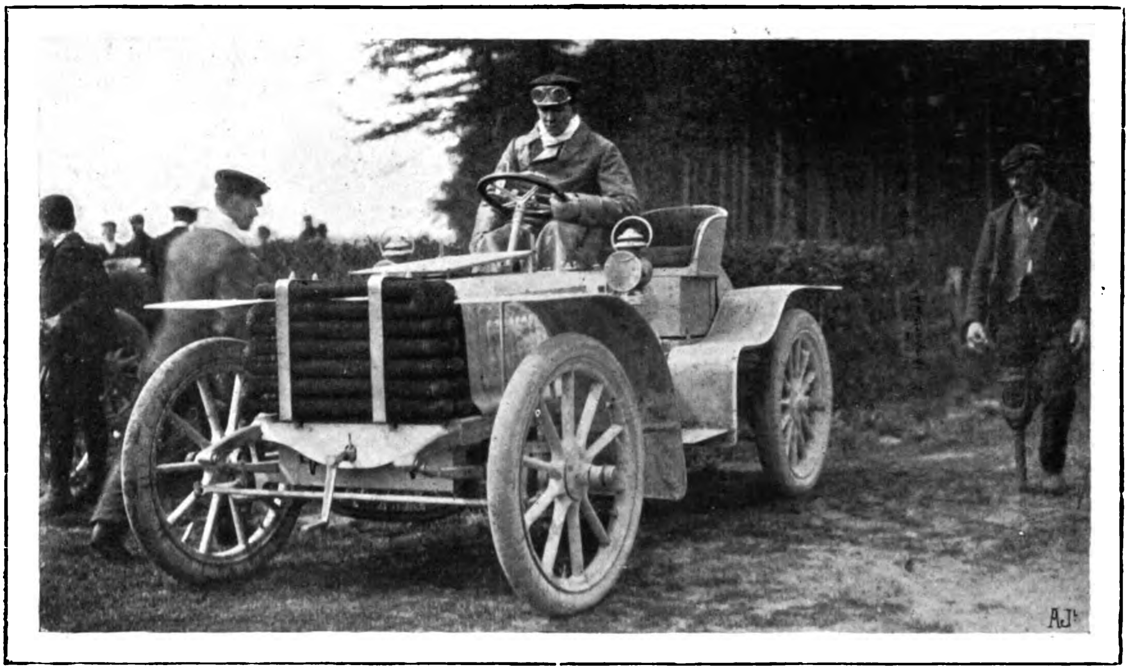
Rapid instructions.
"Please do not sit or stand on the gates."
A warm corner.

More instructions.
Timekeeper Swindley's "devotion" to his work.
Looking up the Course. Mr. Mayhew ready for the Standing Mile.

Orde, taking general control. Mr. Claude Johnson acted as starter, travelling from end to end of the course for this purpose on one of the Lanchester cars driven by Mr. Frank Lanchester.

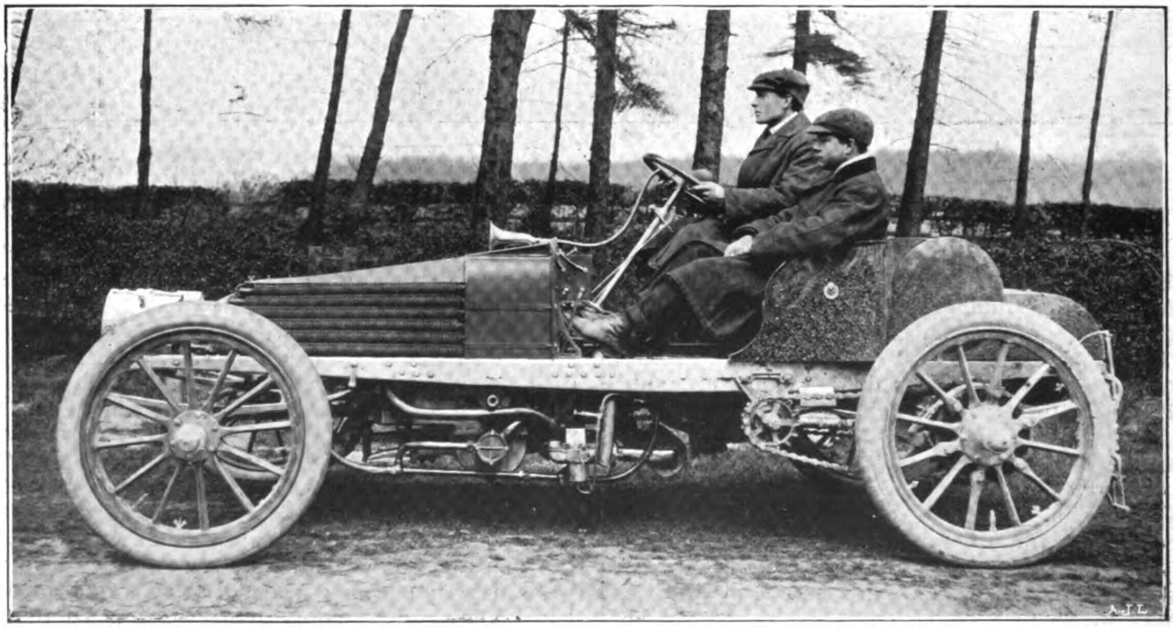
At 1.30, after the three runs down hill and up hill over the flying kilometre were completed, the welcome announcement of an interval for luncheon was made. Then followed the three runs down hill and up hill over the standing mile, which brought the time to about 4 o'clock, when the cars scattered in various directions after the occupants had experienced an exciting and particularly enjoyable day. On the way back Mr. Instone had the unfortunate experience of having to put in the sixth inner tube within three days. Fortunately, he was able to borrow a new tube from Mr. Owers, who was passing. As luck would have it, he then discovered that his tyre pump was out of order. Help, however, was speedily proffered to remedy this lesser misfortune by Mr. Lea, of the London Motor Garage, who drove up in a Magnet car, but unfortunately his pump was too small to be of much use for the 120 mm. tyres. "The Ghost," a splendid little Gladiator car driven by Mr. Martin, of Nottingham, glided upon the scene, and stood by until the damaged tyre was completely set right again, when the rest of the journey was finished in company with Mr. Martin. Needless to say, the apparition of "The Ghost," was accorded a greater welcome than spectres are usually credited with receiving.

The secret of where the hill tests were to take place on the Monday morning was well kept for obvious reasons, and only a privileged few actually witnessed the proceedings. Banbury, a distance of 89 miles, was made the stopping point by the three Napiers from Nottingham on

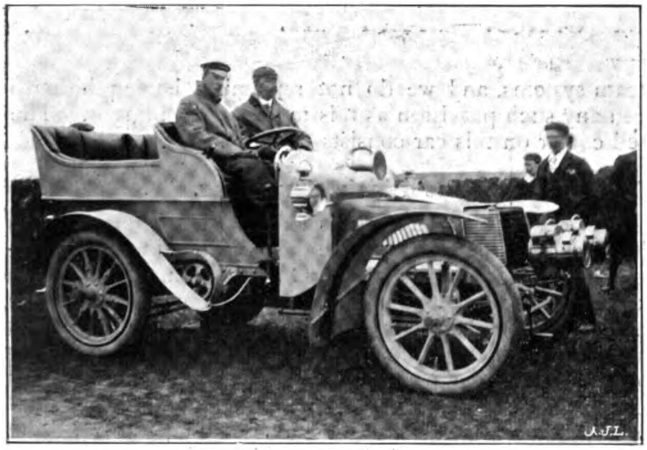


The "scratch" men, or the Hare and the Tortoise. Mr. Charles Jarrott on his Gordon-Bennett Cup Racer.

Saturday night, the Star arriving on Sunday, and at midnight on Sunday the cars started from Banbury for Dashwood Hill (about 42 miles), *viâ* Oxford, in a downpour of rain. Three ladies, viz., Mrs. Cordingley, Miss Pursehouse, and Miss Lisle, were amongst the few who braved the elements at this unearthly hour for the purpose of seeing the cars fly up the hill, and besides the competitors and the officials there were Mr. Edge, Mr. Jarrott, Mr. Hutton, and Mr. J. F. Ochs, in whose car the Secretary was accommodated. The racers were soon after dawn sent for three runs up the hill, which was in a very heavy condition after the rain, and the times taken by the cars over the well-known stretch of 1,180 yards, which is invariably included as an uphill test for cars taking part in the Quarterly 100 Miles Trials, combined with the best average times achieved over the Welbeck Road, determined the selection of the third driver on behalf of Great Britain.



Lieut. Mansfield Smith-Cumming on the Wolseley Racer just after he arrived at Clipstone. The conditions did not permit of Lieut. Cumming testing his car over the Course.



Mr. Instone and his 22-h.p. Daimler which accommodated our Editor.

The following are the various results and how arrived at. The actual times, as already stated, are not published. The following are the tables issued by the Club. They show in seconds and fifths of seconds the times in excess of the fastest times which were occupied by the various cars in covering the flying kilometre, the standing mile, and in ascending Dashwood Hill, the time taken by the fastest car being taken as 0 :—

Flying Kilometre.

	Down.						Up.					
	1st run.		2nd run.		3rd run.		1st run.		2nd run.		3rd run.	
	sec.	5th.	sec.	5th.	sec.	5th.	sec.	5th.	sec.	5th.	sec.	5th.
Rolls ...	0	0	1	3	10	4	1	1	4	1	3	1
Stocks ...	0	1	1	0	0	0	0	0	1	1	1	4
Mayhew ...	10	0	6	0	7	4	5	1	4	1	9	0
Lisle ..	7	3	7	0	7	0	7	1	8	4	9	4

Standing Mile.

	Down.						Up.					
	1st run.		2nd run.		3rd run.		1st run.		2nd run.		3rd run.	
	sec.	5th	sec.	5th.	sec.	5th.	sec.	5th.	sec.	5th.	sec.	5th.
Rolls ...	2	4	5	0	1	3	6	2	2	1	2	4
Stocks ...	0	0	1	0	0	2	0	0	2	0	1	3
Mayhew ...	12	2	8	1	4	4	10	0	6	2	6	4
Lisle ...	12	1	11	2	11	2	15	3	16	1	19	0

(1) Over the total of three kilometres down hill Stocks was faster than Rolls by $10\frac{3}{5}$ secs., than Mayhew by $22\frac{3}{5}$ secs., and than Lisle by $20\frac{2}{5}$ secs.

(2) Over the total of three kilometres up hill Stocks was faster than Rolls by $5\frac{3}{5}$ sec., than Mayhew by $15\frac{2}{5}$ secs., and than Lisle by $22\frac{4}{5}$ secs.

(3) Over the total of three miles down hill Stocks was faster than Rolls by 8 secs., than Mayhew by 24 secs., and than Lisle by $33\frac{3}{5}$ secs.

(4) Over the total of three miles up hill Stocks was faster than Rolls by $7\frac{4}{5}$ secs., than Mayhew by $19\frac{3}{5}$ secs., and than Lisle by $47\frac{1}{5}$ secs.

DASHWOOD HILL CLIMB.

	1st Ascent. Secs.	2nd Ascent. Secs.	3rd Ascent. Secs.
Stocks	$5\frac{4}{5}$ ...	0 ...	27*
Rolls	$6\frac{4}{5}$ ..	4 ...	0
Mayhew	$23\frac{1}{5}$* ...	1 ...	1.2
Lisle	30 ...	25.1 ...	23

* Stopped engine when starting at foot of hill.

To arrive at the deciding results from the above figures, the following are the conditions which were laid down when entries for the Eliminating Trials were invited :—

(a) Time which would be occupied in travelling twelve miles at the average speed made over the flying kilometre both up and down.

(b) Time which would be occupied in travelling three miles at the average speed made over the standing mile both up and down.

(c) Time which would be occupied in travelling one mile at the average speed made on the three journeys up the hill.

The whole of the trials, worked out on this basis of 16 miles, show that :—

	Min.	sec.
(1) Stocks was faster than Rolls by	0	$50\frac{1}{5}$
(2) Stocks was faster than Mayhew by	2	19
(3) Stocks was faster than Lisle by	3	22

GORDON-BENNETT.

A SERIOUS difficulty between the German Automobile Club and the Mercedes-Daimler firm may lead to the German Club forfeiting their right to run in the Gordon-Bennett Cup Race. The German Automobile Club are in favour of having amateurs only driving the cars, and the nomination therefore of Messrs. Werner and Hieronymus—the record holder for La Turbie—as their drivers, in addition to Baron de Caters, the other nominee of the Mercedes Company, has raised the point that, under the Gordon-Bennett rules, the drivers must be members of the club they represent. However, there is time for the settlement of these differences, and it is to be hoped that for the sake of the sport a *modus vivendi* may be arrived at.

About 3,500 of the police and military will be stationed at various points along the course, in addition to the large number of voluntary helpers who will be placed in charge of the sections by the Automobile Club.

The vessel which the Mors and Panhard firms are chartering for the French competing cars will be the "Ferdinand de Lesseps," of about 3,500 tonnage, and will start for Ireland from Havre. The vessel will probably be carrying about 22 French cars, and, in addition to the representatives of the competing firms, a number of other French enthusiasts will take passage, comprising quite a little French colony in themselves. There will be accommodation for 60 first-class and 44 second-class passengers. The start will be made on June 27th, arriving at Dublin the next day, the vessel returning on July 4th. The inclusive fares for the whole trip on this "floating hotel" will be, 1st class, £20 ; 2nd class £12.

THE CHABOCHE STEAM CARS.—PART III.

The Condenser.

THE condenser, T, which is seen in Fig. 9, is built up of a large number of corrugated flexible pipes, which are mounted vertically, and are placed inside a metal casing. The tubes are connected together so that the steam flows through them in parallel, entering at the top and issuing out through the pipe, T^1, at the bottom. In the 12-h.p. car four rows of these pipes are placed, one behind the other, and there are thirteen pipes in each row. Being flexible, they are unlikely to be broken by any jolting of the vehicle, and, being corrugated, they have a large cooling surface. The tubes in each row are connected together, top and bottom, by ordinary horizontal pipes, and each of the horizontal pipes terminates at its ends in T fittings. The four rows are held together by bolts, which pass through the T fittings, and tighten up the face joints between them. The steam enters through the pipe, S^3, at the top, on the left-hand side, and the condensed water is forced up from the bottom, on the right-hand side, through the pipe, T, to the top of the water tank; any surplus steam then finds its way through the overflow pipe, G^4. The inner end of the overflow pipe, G^4, is brought close up to the top of the tank, so that any oil which may be present in the tank flows away when the tank is refilled.

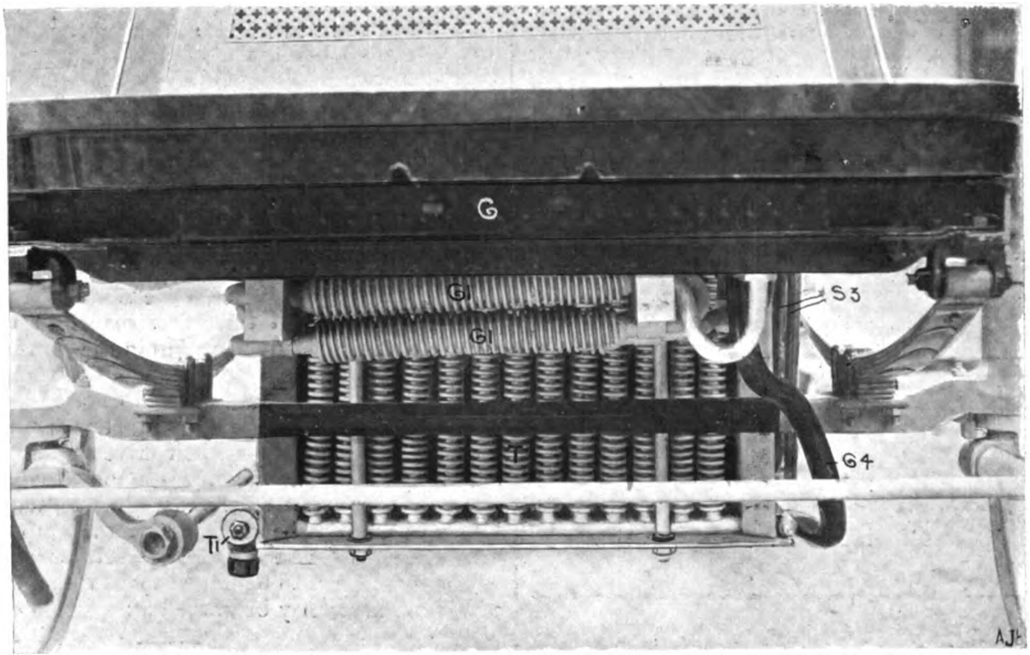


FIG. 9.—View of the front of the Car, showing the Feed-water Cooler and the Condenser.

The Feed-Water Cooler.

A portion of the water-tank, G, is seen in Fig. 9, and the cooling tubes, G^1, through which the water passes on its way from it to the feed pumps, are prominent. These tubes are similar to those employed in the construction of the condenser, and are provided in order to avoid any risk of steam pockets being formed in the pumps, which is likely to occur when pumping hot water. The trouble arising from this cause has not infrequently been experienced with other steam systems, and we do not remember having hitherto seen any such provision as this made for avoiding it. The feed cooler on this car consists of four tubes.

The Flash Generator.

The steam generator, P, is shown diagrammatically in Fig. 10; its upper coils are also visible in our photographic reproduction, Fig. 2. On the 12-h.p. model the tubes forming the generator are made from seven separate lengths of weldless steel tubing. The water first passes through a tubular grid at the bottom, which is very similar to one of the sections of a Serpollet boiler. The water keeps this grid comparatively cool, and it acts as a partial support for the coiled tubes. The main portion of the generator consists of coiled tubes which, after being wound like a helical spring, are bent backwards and forwards so that the convolutions lie close up to one another in the same horizontal plane. Each of these complete sections looks like a number of large helical springs lying alongside one another. The lowest of these sections is made in two halves so that either half can be renewed separately if necessary. There are four other layers above this one, the only difference between them and the first one being that each of them is made of a single length of tubing, and that the coils in each alternate layer lie at right angles to those in the others. Were it not that the generator is rectangular in plan view instead of being square, all these layers would be identical with one another, but in order that the coils of each alternate layer should pass across the intermediate ones at right angles, some of them are constructed with five long coils, and others with a correspondingly greater number of short coils. The five coiled tube layers are so connected that the water passes from the grid through the top coil first, and then down through each of the other four coils successively. The grid normally forms the feed-water-heater of the generator, the upper layers the steam generator, and the lower coiled sections the super-heater. The steam is led from the lowest coiled tube through the safety valve fitting and the throttle valve to the engine, and the pipe, Q, through which it issues from the boiler, acts as the thermostat for automatically controlling the burner according to the temperature of the steam, as already mentioned.

The generator is enclosed in a sheet metal casing. It is well lagged with fire-proof insulating material, and is fixed to the main frame of the vehicle. The connections between coil and coil are made at the back, outside the generator proper, so that they can easily be got at. Strong connect-

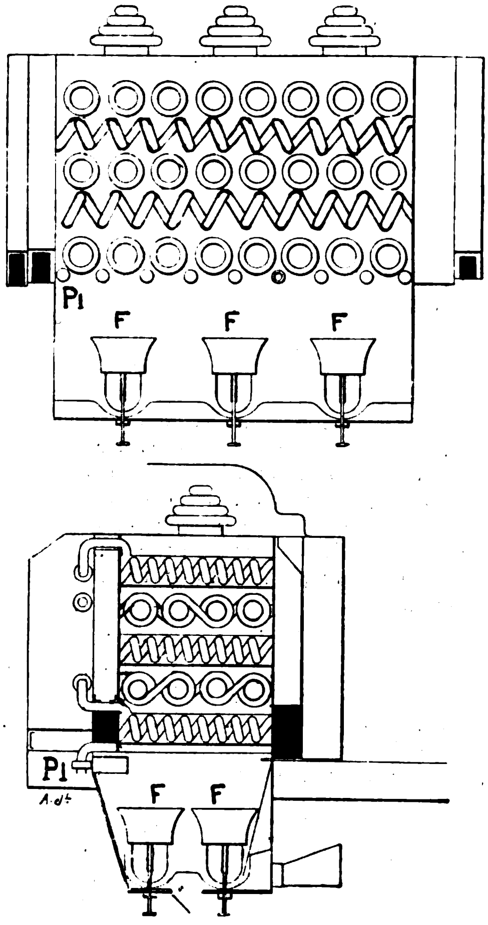


FIG. 10.—Sectional views of the Boiler (P) with the Burners beneath it.

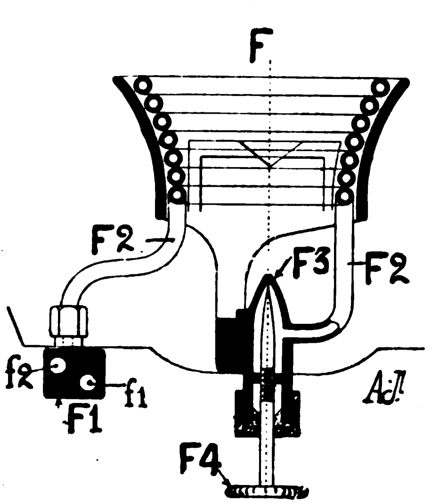


FIG. 11 —Section through one of the Burners (F).

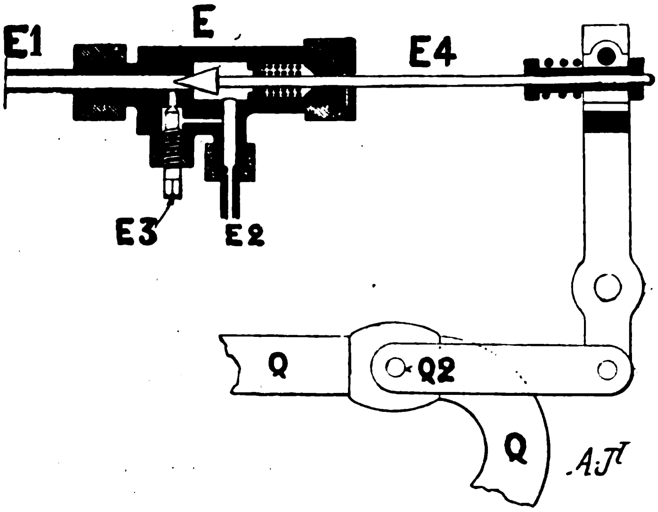


FIG. 12.—The Automatic Fuel Regulator (E).

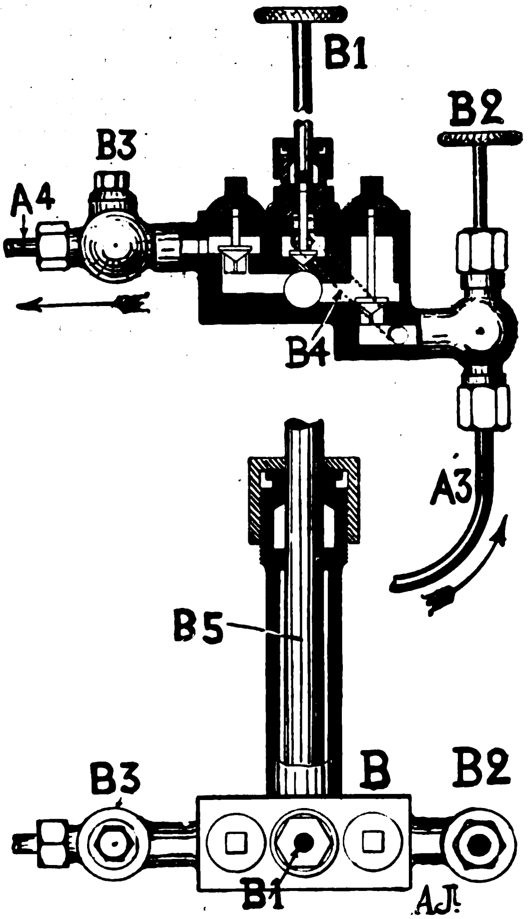


FIG. 13.—Side and plan views, partly sectional, of Fuel Pump (B).

ing fittings are used for the joints. The ends of the tubes are flanged over and the unions force the faces of the flanges together, no packing of any kind being employed. The flames from the burner, which is fixed beneath the generator, pass up through the coils and the burnt gases are allowed to escape through specially shaped chimneys which are fixed to a removable portion of the boiler casing, and lie above it. These outlets for the burnt gases are visible in Fig. 3, where it will also be noticed that a deflector plate is fitted over them to keep any hot gases from finding their way up into the body of the vehicle.

The Burner.

The boiler is heated by six burners (F), one of which is shown sectionally in Fig. 11. The oil, which is ordinary paraffin, is led through a vaporising coil, F^2, to the nozzle, F^3, and the coils of all the burners are preliminarily heated by methylated spirits before the oil is turned on to them. A deflecting cone is fitted immediately above the nozzle in order to spread out the flame, and to cause it to keep the vaporiser hot. It will be noticed that the nozzle is constructed in such a manner that the only place in which small particles of dirt can interrupt the flow of the oil is where it issues out through the fine hole at the top. In order to dislodge any dirt which might collect in it, a needle, F^4, is fitted in the manner shown. By forcing it up into the nozzle it clears the hole of any obstruction, and is then moved down again, out of the way. As already mentioned, the burners are connected up in such a manner that either the forward row or the back row can be used separately. There are three burners in each row; the one set is fed through the hole, f^2, in the fitting, F^1, which passes across the back of the burner casing. The other three are connected with the hole, f^1. The flow of fuel to the two passages through the fitting, F^1, is independently controlled by a distribution valve fitting, fixed near to it at the back of the car.

The Automatic Fuel Regulator.

The automatic device, E, which regulates the flow of fuel to the burners in accordance with the temperature of the steam, when it is passing from the generator to the engine, is shown sectionally in Fig. 12. The oil is led to it through the pipe, E^1, and passes from it through the pipe, E^2. Its flow through the fitting is controlled by a needle valve, E^4, which is connected by a pivoted lever, and a pair of links with the steam pipe, Q; the links are pivoted at one end to the steam pipe at Q^2, and this portion of the steam pipe is so arranged as to be free to expand and contract as its temperature varies. It closes or opens the needle valve, E^4, as its temperature rises or falls, respectively. The needle valve, E^4, does not entirely cut off the flow of fuel through the fitting, for a by-pass passage is also provided in it. The quantity of oil which flows through the by-pass can be adjusted by a small screw plug, E^3. This adjustment is so set that sufficient oil passes to the burners to keep them alight, even when the needle valve, E^4, is completely closed.

A considerable length of the steam pipe, Q, is enclosed in a steel tube which lies alongside the main frame on the right; the end of this pipe which is nearest to the boiler is securely fixed to the frame, and the other end is rendered flexible by being curved. By this arrangement, and also in consequence of the lever-arrangement adopted for connecting the pipe with the needle valve, E^4, a considerable range of movement of the latter is secured; in practice, the usual variations of temperature which occur gives the needle a travel of about three-quarters of an inch. It will be noticed that provision is made for adjusting the position of the needle-valve relatively to the steam pipe, and that a small spring is provided in order to prevent any chance of the apparatus being damaged, owing to the expanding steam pipe being able, under certain circumstances, to press the needle forcibly down on its seat.

The Fuel Pump and Semi-automatic By-pass.

The fuel pump is shown from two points of view in Fig. 13, the one being a side view and the other a plan, both partly in section. The pump plunger, B^5, is driven by the eccentric in the combined crank chamber and gear-box, in the manner already described. The supply pipe, A^3, leads the oil from the main tank to the shut-off valve, B^2, and to the suction valve. The oil is forced by the pump through the ordinary delivery valve, and through an additional check valve, B^3, flowing by the pipe, A^4, into the reservoir (*c*), in which it is stored under a pressure of air. An additional passage, B^4, leads from the pump cylinder, through a spring-loaded valve (which normally closes it) back to the supply side of the suction valve. When the pressure in the pump cylinder reaches a certain point the loaded valve is opened by it, and the oil is then by-passed back to the supply pipe. The pressure on the spring holding this valve down on its seat can be varied by the driver; to do this, he screws down or unscrews the spindle, B^1. In this way the pressure on the oil in the chamber, from which it is delivered through the hand-controlled (c^1) and the automatically regulated (E) devices to the burner, can be varied at will.

The Mechanical Water-Pump, H.

The feed-water-pump, H, which is driven by the engine, is shown sectionally in Fig. 14. It is of somewhat peculiar design, and is constructed so as to avoid steam or air pockets from being formed in it. For this reason the plunger, H^4, works through a stuffing-box in the open end of a comparatively large chamber, instead of in a closely fitting cylinder—the chamber is of the shape shown—so that any air or steam can readily escape through the delivery valve, H^6, when the pump starts working. This valve, and the suction valve, H^5, are held down on their seats by their own weight, and are prevented from moving in any but a vertical direction by guides forming part of the inspection covers placed above them. The water from the supply tank is led to the pump by the pipe, H^2; the delivery-pipe does not show in this view.

The Automatic Feed-Water Regulator, K.

The apparatus which automatically regulates the quantity of water delivered by the feed pumps, H and J, to the boiler, and to the pressure-chamber containing a supply of water under a pressure of air, is shown both in vertical and in horizontal sections in Fig. 15. The water from the mechanical pump, H, enters through the pipe, H^3, and, from the hand-pump, J, it enters through the pipe, J^3. It then has two alternative valves to pass through, the one, K^7, allowing it to flow through the pipe, L^2, to the pressure-chamber, L, and also through the stop-cock, K^1 (when it is open), to the thermal storage coils, N, and to the boiler; the other valve, K^5, is normally held down on its seat by the pivoted lever, K^4, which is caused to press on its stem by the spring, K^2. When, however, the valve, K^5, is allowed to open, the water has a free path through it, and thence, through the pipe, G³, back to the water tank. The valve, K⁵, is only allowed to open when the pressure exerted upon it by the lever, K⁴, is relaxed, and this can only occur when the piston, K⁶, in the small cylinder, also provided in the same fitting, is forced upward with sufficient pressure. The pipe, M, leads into the small cylinder beneath the piston, K⁶, and is in direct connection with the pressure chamber, L, containing the feed-water. It will, therefore, be seen that so long as the pressure in the chamber, L, is below a certain point the whole of the water delivered by the feed pumps will be forced into the pressure chamber or the boiler, but that so soon as the pressure attains a certain point the water will then be by-passed back through the valve, K⁵, to the supply tank. The pressure exerted by the spring, K², and the lever, K⁴, can be regulated by the thumb-nut, K³; in this manner the normal pressure of the steam in the generator (which is under normal conditions the same as that in the pressure chamber, L) can be adjusted. The rod which passes through the spring, K², is connected at its lower end with a foot-pedal (not shown in Fig. 15), so placed that the driver can momentarily increase the boiler pressure at will by pressing the pedal down with his heel. The passage of the water to the boiler, either from the pumps or from the pressure tank, can at any time be cut off by the driver by means of the stop-cock, K¹.

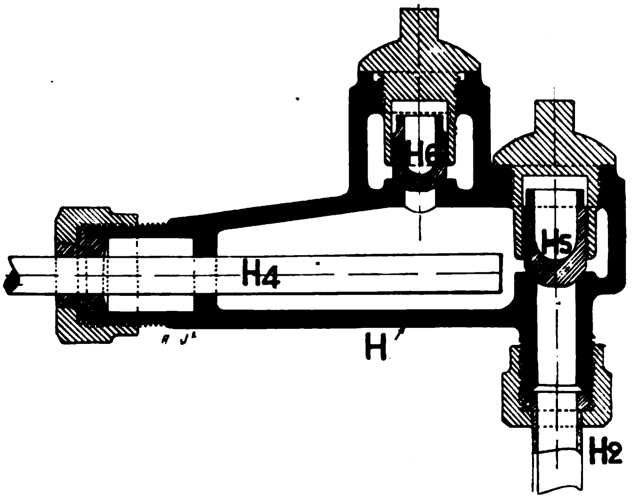


FIG. 14.—Section through Mechanical Feed-water Pump (H).

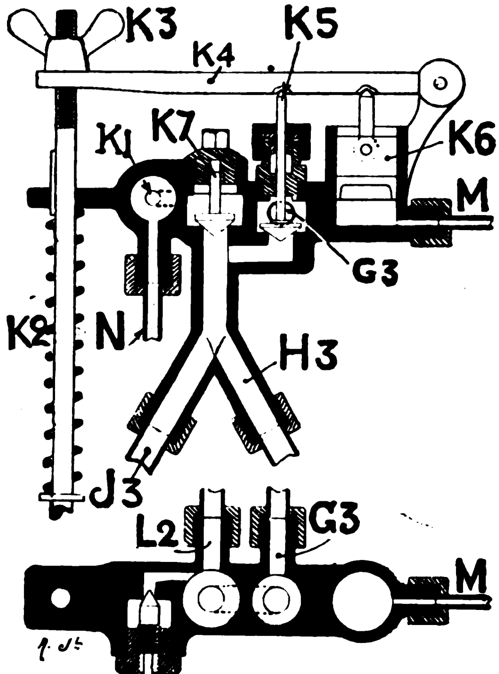


FIG. 15.—Vertical and horizontal sections through Automatic Feed-water Regul tor (K).

Controlling Devices and Pressure Indicators.

The means which are provided for enabling the driver to control the mechanism from the seat will be gathered from Fig. 16, which shows the levers, pedals, handles, and gauges fixed in position near the steering pillar. The engine is thrown in and out of gear, and the high or low gear are alternatively introduced by the horizontal lever, V¹, on the steering pillar. This lever moves over a quadrant which has three notches, corresponding with each of its positions. The speed of the engine, and of the car, is regulated by the lever, S¹, placed just above the lever, V¹. This lever, S¹, operates the throttle valve, S, which is of the needle valve type. The needle is provided with a very quick thread, which serves to feed it towards or away from its seat when it is rocked in the one direction or the other about its axis. The small horizontal lever, U², lying just

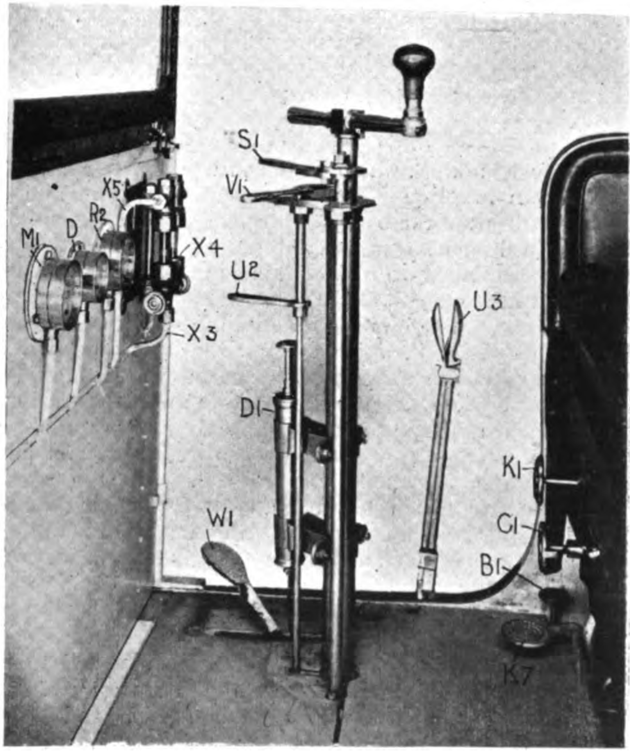


FIG. 16.—View of Steering Pillar, Controlling Handles and Pedals, and Dashboard with Pressure Gauges and Lubricator.

in front of the steering pillar, is connected with the four drain cocks on the cylinders, and enables any water which may have collected there to be let out before starting the engine. The small hand pump, D^1, which is also fixed to the steering pillar, is for forcing air into the pressure chamber, (C), containing the fuel. It has been found necessary to provide for this, because the oil absorbs a certain amount of air, and because it is desirable that the compressible cushion formed by it in the chamber should bear a certain relationship (in volume) to the capacity of the chamber itself.

The side lever, U^3, is connected with the reversing gear of the engine. Its quadrant has only three notches, as it is not intended to be used for varying the cut-off, either when running forwards or backwards, although such intermediate notches could, of course, have been provided if it had been found advisable. The other side-lever, W^2, which actuates the spoon-brakes on the rear wheels, is not seen in Fig. 16; it is, however, in evidence in several of the other illustrations which we have given previously. The foot pedal, W^1, in the floor, operates the band-brakes, which are fitted to the hubs of the rear wheels. The other pedal, K^7, which is placed so that the driver can press it down with his heel, has already been referred to as the "accelerator"; the manner in which it causes the steam pressure to be increased has already been described. The small hand-wheel, B^1, will be recognised as that which varies the normal pressure in the fuel chamber (C), by regulating the strength of the spring which holds the by-pass valve of the pump down upon its seat. The small hand-wheels, C^1 and K^1, are those of the shut-off cocks, controlling the fuel-feed to the burner and the water-feed to the boiler respectively.

The fittings on the dash consist of the sight-feed lubricator, X^4, from which the oil is led to the steam-chests of the two cylinders, and of the three gauges, M^1, D, and R^2, which indicate the pressures in the water-compression chamber (L), in the fuel-compression chamber (C), and in the main steam pipe (Q), respectively.

The Fuel and Water Tanks.

The fuel tank, A, which is constructed of copper, and was shown in place in Fig. 3, lies across the frame immediately in front of the boiler. It has a sufficient capacity for running a distance of about 120 miles. It is so arranged that it can be filled up from a funnel-mouthed pipe passing through to the outside of the body, where it terminates with a screw cap. The level of the oil in this tank is indicated by a gauge glass, A^1, which is placed beneath the driver's seat alongside the three pressure chambers, X, L, and C. The water tank, G, fits into the space formed by the bonnet in front. It requires to be refilled after running about 40 miles, but a larger tank is fitted when desired; it is filled up through a removable cap on top. On the special Chaboche car which has been built for running in the Paris-Madrid race, we learn that the water-tank and the condenser are of such a size as to carry sufficient water for running about 400 miles.

(*To be continued.*)

THE following new members have been elected to the Society of Motor Manufacturers and Traders: W. & A. Bates, Ltd., Continental Automobile Co., Ltd., East London Rubber Co., J. Ernest Hutton, Jesse Ellis & Co., Ltd., John Marston, Ltd., and the New Orleans Motor Co., Ltd.

PROPOSED PARLIAMENTARY BILLS.

I.—The Bill Introduced by Mr. J. Scott Montagu, M.P., last Session, as Amended to Date.

A BILL to provide for the registration of motor-vehicles, and to amend the Locomotives on Highways Act, 1896.

Be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. After the commencement of this Act any person driving or in charge of a vehicle as herein defined on a public highway shall, unless some person is registered owner thereof, and unless such vehicle bears thereon a number or such other mark of identification as may be prescribed, be guilty of an offence punishable summarily.

2. In addition to the powers conferred by the Locomotives on Highways Act, 1896 (hereinafter called the principal Act), and notwithstanding anything in the said Act contained, the Local Government Board may make regulations.

(1) Prescribing the conditions under which and the mode in which and the places where the registration and numbering or other means of identification of such vehicles may be effected and the persons also may be registered as owners of such vehicles.

(2) Fixing a sum not exceeding five shillings for each vehicle, which shall be charged and paid to the County Council in whose district the licence is granted as duty or licence in respect of such registration, and which duty shall be levied and dealt with as the additional duty imposed by the principal Act, such licence money to be applied in aid of the Highway Fund of such County Council.

3. The person proceeded against for breach of any by-law or regulation made under this or the principal Act or of any provision of such Acts may appeal to a judge of the King's Bench Division of the High Court of Justice.

4. "Vehicle" shall mean and include any vehicle referred to as light locomotives in the principal Act as well as any vehicle propelled by mechanical power if it is designed to carry its load upon its own platform and does not exceed, including such load, a total moving weight of fourteen tons, or when used for the purpose of drawing one vehicle does not exceed a joint total moving weight of twenty tons.

5. The rate of speed at which a light locomotive may be travelling shall not, irrespective of the other circumstances of the case, be a ground for taking proceedings or imposing fines or penalties against the owner or person in charge thereof.

6. The Locomotives on Highways Act, 1896, is to be read as one with this Act, except Sect. 4, which is hereby repealed, except in the case of vehicles of a weight unladen exceeding six tons.

7. This Act may be cited as the Locomotives on Highways Act, 1902, and shall come into operation on the first day of January, 1904.

II.—A Bill Suggested by Earl Russell.

A BILL TO AMEND THE LOCOMOTIVES ON HIGHWAYS ACT, 1896.

Be it enacted, &c.:—

1. This Act may be cited as the Light Locomotives Act, 1904.

2. The Locomotives on Highways Act, 1896, is hereby repealed to the extent mentioned in the schedule.

3. (1) Every light locomotive shall be required to carry a metal plate not exceeding in length 7 inches, and not exceeding in width 3 inches, upon which shall be legibly engraved or inscribed a distinguishing letter and number.

(2) The Council of each administrative county shall make provision for the supply upon demand to an owner of a light locomotive of a metal plate as aforesaid bearing a distinguishing letter and number, and shall keep a register of such plates, and of the names and addresses of the persons to whom they were issued.

(3) The Council may charge a sum not exceeding five shillings for each plate supplied.

4. The driver of every light locomotive shall be furnished with a certificate of competency after an examination, subject to rules for such examination and regulations specifying the terms upon which such certificate may be held to be framed by the Local Government Board, who may delegate all or any of their powers under this section to the Automobile Club of Great Britain and Ireland.

The rules and regulations shall provide *inter alia*:—

(*a*) That the charge for such certificates shall not exceed ten shillings.

(*b*) That the certificate shall remain in force until cancelled.

(*c*) That the certificate may be cancelled by the Local Government Board for reckless driving, for drunkenness while in charge of a light locomotive, or for other causes which in the opinion of the examining body renders the holder of the certificate unfit to be in charge of a light locomotive. ▌

5. Any person who drives a light locomotive upon the public highway without having the certificate provided for in the preceding section, or without the metal plate provided for in Section 3, shall be deemed guilty of an offence and shall be liable on summary conviction to a fine not exceeding forty shillings.

6. Any person in charge of a light locomotive who wilfully—

(*a*) Neglects or refuses to stop on the demand of any police constable in uniform, or

(*b*) Gives a false name and address, or

(*c*) Neglects or refuses to render assistance after causing an accident involving an injury to any other person, shall be liable upon summary conviction to a fine not exceeding fifty pounds or to imprisonment for a term not exceeding three months without hard labour, or to both, and the Court, after conviction, may further order that his driving certificate shall be cancelled, and the conviction reported to the Local Government Board.

7. This Act shall come into force on the first day of January, 1905, and shall apply to the United Kingdom of Great Britain and Ireland.

SCHEDULE.

Session and Chapter.—59 and 60 Vict., c. 36. Short Title.—Locomotives on Highways Act, 1896. Extent of Repeal.—Section 4.

MECHANICAL ROAD CARRIAGES.*

BY W. WORBY BEAUMONT, M.I.C.E.

MR. BEAUMONT announced that his lecture was of a general or preliminary nature, connecting up the previous series of Cantor Lectures in 1895 with the present time, and as an introduction to the three following lectures which would be of a more technical and detailed description. He said that it was now eight years since the previous lectures were delivered and very great advances had been made. The first thing in the automobile history was the passing of the Act of 1896. This he spoke of as the removal of fetters, although the Act when passed was not a satisfactory one in one respect. It descended to details as to the speed at which vehicles should travel. That detail Parliament had determined without any experience, and it was the one "side-slip" from an otherwise very proper piece of legislation. The whole Act in other respects was general and gave powers to the Local Government Board and the Home Office to deal with the various technical and other details as they should arise. He argued that no Act of Parliament dealing with such technical matters should specify limits which were sure in a few years to become antiquated. With regard to the proposal now being made for the numbering of motor vehicles, he suggested that it would be better that the numbering proposals should be agreed to, since members of Parliament and others consider it necessary that some concession should be made by automobilists in order that the speed limit clause of the Act should be repealed, but he proposed that it should not be under a clause in an Act of Parliament. It should, however, be simply a regulation made under the powers already possessed by, or that should be given to, the Local Government Board. This temporary regulation should then be withdrawn, when the proper time arrived, and automobile vehicles, like all other vehicles, would be free to move about without this feature of annoyance.

In referring to the regulations existing prior to 1896-7 concerning the use of petroleum spirit in this country, Mr. Beaumont pointed out that experience had shown conclusively that the great fears entertained concerning the danger of that liquid were unfounded. Dealing with the successful vehicles of 1896, it was pointed out that, great as had been the change since that time, the general lines of the Levassor-Daimler Car and the Peugeot Car had proved to be those subsequently followed.

Reference was in particular made to the important work done by motor carriage builders in calling for and obtaining materials with specially good mechanical properties. The concluding part of the lecture was a glance at a few of the greatest changes which had taken place, and particularly with regard to the enormous increase in the power which it was now possible to get on a car of given weight. In 1896 the 4½-h.p. Panhard-Daimler Car ran 1,070 miles at an average speed of nearly 16 miles per hour, and this really was a remarkable performance. To-day vehicles with tyres as soft as the paw of a greyhound were making speeds on ordinary roads which were speed personified as compared with the dilatory diligence of the express trains on some of their railways.

The accompanying increase in speeds attainable was well emphasized.

The lecturer concluded by saying that reference to the modern applications of the motor vehicle in various forms for public service, omnibuses, Corporation work, merchandise, &c., would be dealt with in the succeeding lectures.

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* Society of Arts Cantor Lecture.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

SPECIFIC GRAVITY OF MOTOR SPIRIT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The paragraphs which have recently appeared in the Press respecting the specific gravity of "Pratt's Motor Spirit" have made it evident that many automobilists are apparently unaware that the specific gravity or density of a spirit is not, of itself, an invariable indication of its suitability for motor purposes. As a matter of fact, it is quite possible to have a spirit of a specific gravity or density of ·680, as ascertained by the hydrometer or densimeter, which shall, nevertheless, be quite useless for motor purposes.

Provided that petroleum spirit is properly manufactured, it may safely have, in our opinion, a specific gravity as high as ·715 or even ·720, and give perfect satisfaction in motor cars. It was not until after we had satisfied ourselves, by means of practical tests, as to the correctness of this view, that we decided to supply "Pratt's Motor Spirit" of a greater density than ·680. At the outset we supplied ·700 specific gravity, and a month or more's trial of this demonstrated the fact that "Pratt's Motor Spirit" of that density gave perfect satisfaction, so much so that no difference in the results obtained was apparently noticed. From ·700 specific gravity, we proceeded gradually to ·715 and ·720. Whilst we have received a few complaints respecting this latter spirit, we have found that these have, in most cases, been made by those persons who, having tested it with a hydrometer or densimeter, and found it to be of a greater density than ·680, had at once concluded that the spirit must necessarily be unsuitable. A far larger number of correspondents have, on the other hand, written to say that they have not been able to observe any difference in the results obtained.

In order, however, that there may be no uncertainty about the matter, we have requested Dr. Boverton Redwood to make a careful investigation of the subject, and we expect shortly to have his report.

In this connection it is of importance for automobilists to know that, at the present rate of development of the motor car industry, it may not improbably become, in the near future, a matter of great difficulty to supply the demand for spirit if ·680 specific gravity be insisted upon. Automobilists will then be compelled to use a spirit of a higher density, such, for example, as we have been speaking of.

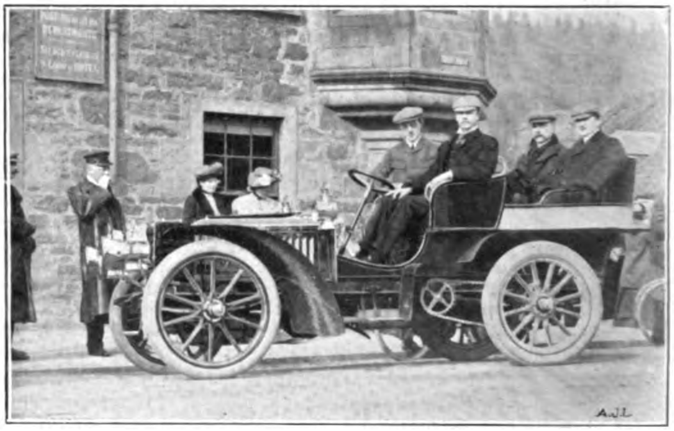
We can still continue to supply "Pratt's Motor Spirit" of 680 specific gravity, though only to a limited extent. In order that those automobilists who are to compete for the Gordon-Bennett Cup may feel no uncertainty as to the quality of motor spirit which will be procurable in Ireland, we beg to say that we are making extensive arrangements for having ample stocks of "Pratt's Motor Spirit" ·680 specific gravity placed at convenient points there.

Yours faithfully,
ANGLO-AMERICAN OIL COMPANY (LIMITED).
FRANK E. BLISS, *Director.*
Anglo-American Oil Company (Limited), *April 27th.*

THE Society of Motor Manufacturers and Traders have resolved to subscribe 10 guineas per annum to the Roads Improvement Association.

ON May-Day, at 8 a.m., a motor parade has been arranged by the Thornycroft Steam Wagon Company on the Embankment, between Westminster Bridge and Charing Cross. The idea—an admirable one—is to encourage the drivers of motor vehicles to take an active interest in the condition of the machinery and the general appearance of their wagons in the same way as the drivers of heavy horse vehicles are encouraged by the Cart Horse Parade. Prizes are to be awarded, the judges being the Hon. John Scott Montagu, M.P., and Mr. W. J. Bull, M.P. The method of awarding marks and conditions of competition are that drivers of wagons eligible for the 1st, 2nd and 3rd prizes must have had charge of their vehicle for a minimum of three months. Marks will be granted for the period exceeding three months, during which the driver has had charge of the vehicle, for cleanliness of boiler and mountings, of all gearing, state of lubrication of gear, and for the general cleanliness of wagon.

1.



2.

1.—The Cars at the Dreadnought Hotel.

2.—Mr. George MacMillan (Hon. Sec. Eastern Section) driving his 16-h.p. De Dietrich with Mr. Norman Macdonald (Chairman of the Scottish Club) on his left, Mr. John Macdonald (Chairman of the Eastern Section) sitting behind the driver, and Mr. R. J. Smith (Chairman of the Western Section) on the left.

SCOTTISH AUTOMOBILE CLUB'S RUN TO CALLANDER.

SCOTTISH AUTOMOBILE CLUB.

CALLANDER, in Perthshire, was the town fixed on for the annual general meeting of this club, and it is probable that no other more suitable point could have been selected. About 50 miles from Edinburgh and 40 from Glasgow, it conceded something to those members from the far north who cared to attend. About fifty cars brought over two hundred members and their friends for luncheon at the Dreadnought Hotel during the afternoon, and this ancient and extensive hostelry had a stirring and trying time for an hour or two, out of which, however, it emerged in a highly creditable manner.

The club meeting was held in the smoking-room about 3 o'clock (Mr. Norman D. Macdonald, chairman of the Club, presiding), and was to a large extent of a formal character. The Club as now constituted consists of two, the Eastern and the Western Sections, each controlling matters within its own area, the two acting in unison as a single club only in questions of external policy, and joint runs and competitions. The annual report, therefore, dealt only with questions of common interest, such as the membership, which showed an increase from 71 to 169 during the year ending the 31st January last, the present totals being, Eastern Section 56, and Western Section 113. The funds also were shown to be in a healthy state. The report, after referring to the competition of last year, went on to outline the coming season's work, including a hill-climbing competition at Lanark on the 23rd; the Glasgow-London Non-Stop Trial; the negotiations with reference to the conditions of affiliation with the A.C.G.B.I.; and the preparation of a Club Handbook. The Sections having previously elected their own officials, only ten members to the General Council fell to be elected by the meeting. The following were the ten chosen:—Messrs. J. H. Irons, W. L. Sleigh, Norman D. Macdonald, Dr. Dawson Turner, Edinburgh; Messrs. H. Prosser, Wm. Weir, J. M. Ross, J. R. Nisbet, J. T. B. Crosbie, Glasgow; and J. H. Paterson, Aberdeen. The meeting passed a most cordial vote of thanks to the honorary general secretary, Mr. R. J. Smith, C.A., to whose untiring attention and unfailing tact the success of the club is so largely due.

It is not possible to give exactly the names of all the members who arrived, but amongst them were the following:—Mr. Geo. McMillan, honorary secretary Eastern Section, with whom were Mr. Norman D. Macdonald and Mr. John Macdonald, on a 16-h.p. De Dietrich; Mr. D. Croall, 10-h.p. Napier; Mr. Inglis, 9-h.p. De Dion; Mr. Keith Murray, 7-h.p. Panhard; Mr. A. Barr, 7½-h.p. Wolseley; Mr. W. L. Sleigh, 12-h.p Peugeot; Mr. A. Melow, 10-h.p. Panhard; Mr. Ballantine, 22-h.p. Daimler; Mr. Thos. Morrison, 16-h.p. Waverley, all from Edinburgh. Mr. Wm. Wier, 10-h.p. Wolseley; Mr. Seligman, 7½-h.p. Wolseley; Mr. J. H. Steen, 10-h.p. Wolseley; Mr. H. Prosser, 10-h.p. Panhard; Dr. Luke, 10-h.p. Argyll; Mr. J. M. Ross, 10-h.p. Albion; Mr. James Laird, 10-h.p. Wolseley; Mr. John Peacock, 8-h.p. Peugeot; Mr. J. Cameron, 7½-h.p. Wolseley; Mr. H. M. Napier, 10-h.p. Wolseley; J. Trotter, Gladiator; Mr. T. B. Murray, 12-h.p. Albion; Mr. W. Torrance, 10-h.p. Albion; Mr. R. A. Whytlaw, 9-h.p. Arroll-Johnson; Mr. R. McEwan, 8-h.p. De Dion; Mr. C. J. C. Steen, 9-h.p. Darracq; Mr. W. A. Smith, 10-h.p. Argyll; Mr. J. R. Nisbet, 10-h.p. Argyll; Mr. Claud Hamilton, 10-h.p. Wolseley; Mr. John Shaughnessy, 8-h.p. De Dion, all from Glasgow. Mr. Holms-Kerr, 16-h.p. De Dietrich, from Paisley; Mr. Rankin, 7-h.p. Panhard, and M. J. Wilson, 14-h.p. Elswick, from Falkirk; Mr. J. R. Couper, 2¾-h.p. Excelsior bicycle with trailer; Mr. A. J. Dixon, 7½-h.p. Wolseley; and Mr. R. Forrester, 7-h.p. Panhard, from Stirling; Mr. Archibald Stevenson, 9½-h.p. Clement, from Alloa; Mr. J. T. Forgie, 7½-h.p. Wolseley, from Bathgate; Mr. E. A. Brown, 10-h.p. Argyll, from Shandon; Mr. R. J. Smith, Glasgow, 5-h.p. Wolseley; Mr. J. H. Paterson, Aberdeen, 12-h.p. Peugeot; Mr. F. Lobnitz, Renfrew, 10-h.p. Argyll; Colonel Alexander, Bridge of Allan, Oldsmobile; Mr. Keith Macdonald, Edinburgh, Oldsmobile; Mr. Andrew Reid, Glasgow, White steamer; and a number of others.

The Scottish Club has hitherto been not a little unfortunate in the matter of weather, but last Saturday's conditions went a long way towards making amends. The day was bright and dry, and although cold towards evening, no discomfort was experienced. The only unpleasant incident which came to our knowledge was an accident to Mr. Govan, of the Hozier Company, who was struck in the mouth by a stone while passing through Doune, his upper lip being badly cut and his teeth dislodged. Stone throwing was rather frequent on the road, and it would perhaps be well for the Scottish Club to communicate with the county police forces on the subject.

Scottish Automobile Club (Western Section).—It will be recollected that the Scottish Club was granted permission by the parent body—subject to the rules being approved by the Club Secretary—to institute 100 miles non-stop runs and to grant certificates of the results. The course for these trials has now been selected, and it cannot be denied that the test is a sufficiently drastic one. The route follows the north bank of the Clyde to Craigendoran, thence alongside the Gareloch to its head. From Garelochhead the road surmounts Whistlefield Hill, of which some of the competitors in the 1901 Reliability Trials have probably unpleasant recollections, then on to Arrochar on Loch Long, afterwards crossing to Tarbet on Loch Lomond, and gradually ascending, after passing Ardlui, till the furthest point, Crianlarich, is reached. The return journey is the same to Tarbet, but afterwards follows the side of Loch Lomond, and passing across the Leven at Alexandria, joins the first part of the route near Bowling, thence back to Glasgow, total distance 107 miles.

On Tuesday, the 21st April, the first of the trials was carried through at the request of the Mo-Car Syndicate, Limited, of Paisley, who entered three 12-h.p. Arrol-Johnston cars for the run. One of the cars was of the six-seated type, the others, dog-cart shape, each seated for four, all having a full complement of passengers. As with the parent Club, the supply of water and petrol was measured and the consumption of both recorded. From the Club garage in McAlpine Street, the cars proceeded to a public weighbridge where they were weighed with and without passengers. During the run which followed, all the cars behaved well, but in the case of the six-seated car it was found necessary to relieve it of some of the passengers at the steepest point of Whistlefield Hill. On the Loch Long side of this hill the brakes were tested while running both forward and backward, but beyond demonstrating their efficiency to stop the cars while running well under control, these tests proved nothing. No stops other than those mentioned occurred throughout the run, the car on which the writer was seated travelling the whole distance without a single stop from traffic or other cause, excepting those caused by the brake tests, from the moment of leaving the weighbridge until the return to McAlpine Street. Control points to restrain speed were fixed at Garelochhead, Tarbet Hotel, Crianlarich, Tarbet Hotel, Alexandria Bridge, and the finishing point, and on them all except that between Tarbet and Crianlarich, on one part of which the road rises 600 feet in 6 miles, the cars ran well up to the regulated maximum of about 18 miles an hour. The total time was about seven hours, giving an average speed of just over 15 miles an hour. The cars were timed on a distance on Whistlefield Hill, the length and gradient of which are known, and any certificate issued will no doubt testify to the speed on this stretch, and to the consumption of petrol and water over the whole distance.

Scottish Automobile Club (Eastern Section) opening run to Middleton, Midlothian, the seat of Mr. H. E. Moss. In the group standing to the left are Mr. H. E. Moss, Mr. John Macdonald, and Mr. Norman Macdonald.

The 75-h.p. Napier Racing Launch.—We are able to give a few particulars of the petrol launch which the Napier Company are building for competing in the International Motor Launch Race, which is to be held in connection with the Irish Automobile Fortnight in June. The hull measures something less than 40 feet over all length, and its weight alone will be under half a ton. Its beam will be 5 feet, and the moulded depth 2 feet. It is being built entirely of steel, the frames and floors being all of light angle and the plates of 20 B.W.G. sheet. The engine will be one of the company's 75-h.p. type, having four cylinders, and running at a normal speed of 800 revolutions per minute. The total displacement of the launch will be about 1½ tons, and a speed of about 25 knots per hour is anticipated. The boat will have a canoe-like appearance, being pointed at both ends and covered in with a rounded decking fore and aft. The engine is to be placed somewhat forward of the centre, and the propeller-shaft passes through the bottom of the boat, some distance from the stern. In a rough drawing, which we have seen, two two-bladed propellers are shown fixed to the shaft in tandem; they lie beneath the keel.

THE APPEAL TO THE COURT OF KING'S BENCH.

WE believe that we were the first to put forward the proposal that, in the case of convictions of automobilists by Petty Sessional Courts, appeal should be allowed to the Court of King's Bench, and that a provision to that effect should be embodied in the Bill which the Committee of the Automobile Club were then framing with a view to modifying the existing Act of 1896. Since that date the proposal has been generally adopted, and, as our readers will see from another column, is now incorporated in the Committee's proposed measure. Since we first put forward the suggestion, however, the Judges in the Court of King's Bench have shown by the several decisions which they have given in Divisional Courts that their prejudice against the automobile, or, at any rate, their want of sympathy with the automobilist, is almost as pronounced as that of any country magistrate. Principal amongst these adverse decisions is that given in the case of Mayhew *v.* Sutton, in which, as our readers know, the learned Judges held there was danger to life and limb, though no lives nor limbs were present. Then there was Mr. Justice Wills, who regarded automobilists as exactly on the same level as poachers, and maintained that prejudice against automobilism was as permissible in a magistrate as prejudice against poaching—thus suggesting that poaching is a sport or automobilism, *per se*, a crime. Finally we have the decision of the Lord Chief Justice, in Mr. De Wilton's case, deciding that it is fit and proper behaviour for a magistrate to give evidence in an automobile case, on behalf of the prosecution, from his place on the Bench, and then to discuss the case with his brother magistrates who are proceeding to give judgment. Such being the temper of the Judges of the Court of King's Bench at the present day, we doubt whether automobilists would gain much by the right of appealing to them, or whether the advantage is really worth fighting for. When we first put the proposal forward we must admit that we had underrated the extent to which the judges of to-day have turned their backs on the great traditions of the past.

PREMATURE RACING.

LAST week we drew attention to the complaint made by the Athy District Council of the inconsiderate driving over the Gordon-Bennett course. Every automobilist and lover of fair play will unquestionably support the dignified protest made by the Council against this abuse of the privilege, which the local authorities in Ireland have been so ready to assist those interested in organising the race in procuring. It appears that a number of cars, accompanied by cyclists and motor cyclists, have been during the past week or two indulging in the practice of racing over the Gordon-Bennett course at rates of thirty to forty miles an hour. There can be no question at all that it is unwise and impolitic in the extreme to exasperate the local authorities by endangering the lives and limbs of the peasantry along the lines of the route in the manner described. All the County and District Councils through whose districts the Gordon-Bennett Race will pass have done everything in their power to facilitate its being held, and to ensure the passage of the enabling Act. We maintain, therefore, that they and the population they represent are entitled to a degree of consideration which some automobilists unfortunately appear to have flagrantly neglected.

PARIS-MADRID.

As the time comes near — May 24th — for the start in this very important event, the interest grows more acute daily. Much as French automobilists would like to regain the Gordon-Bennett cup, as a matter of general interest, the latter is almost totally eclipsed by Paris-Madrid. Prizes are being offered in profusion, several being now officially announced as coming from Spain. These include one from the King of Spain for the first car, by classing, arriving at Madrid; another from the Prince and Princess of the Asturias to the first car passing the Spanish frontier. With anything like fair luck this should fall to Mr. Charles Jarrott. The Infanta Isabella gives a prize to the second car, by classing, arriving at the Spanish capital, and other prizes are offered by the Spanish Minister of Agriculture (for alcohol as fuel), the Madrid Municipality, the Spanish Auto Club, the Ladies' Society of Madrid, &c. The Burgos and St. Sebastien authorities also offer prizes for the first car reaching their towns, respectively.

The fare for the special Paris-Madrid train will be £8.

Between Paris and Bordeaux there are 38·100 kilometres of neutralisation, involving about 3 hrs. 30 mins. of time in passing through. Over the entire distance about 35 fine stretches of level road will be encountered, and give the high-powered cars a chance of making some special efforts at speed.

At present it is not easy to obtain reliable particulars of the leading cars which are to take part in the run. The Serpollet Company, however, are building six 40-h.p. and three 20-h.p. cars for the race. The larger vehicles are to be driven by professional drivers, including MM. Le Blon, Chanliaud, Caillois, and Rulot, and the smaller ones by amateurs, viz.: M. Olliver, Baron d'Udeken, and M. Dacoz. The engines have been specially designed for these vehicles and differ in certain respects from the standard models. The 40-h.p. equipment is said to be capable of giving as much as 120-h.p. Honeycomb multitubular condensers are being fitted, and it is expected that the cars will be able to run about 250 kilometres without refilling the water tank. The wheel base of the large cars is 2 m. 40 mm., and the track is 1 m. 40 mm. The wheels are 870 mm. in diameter.

The Mors cars will be driven by Baron de Forest, Mr. J. K. Vanderbilt, and MM. Fournier, Salleron, Rigal, Gabriel, Leger, and Terry. The peculiar feature of the new Mors racer is found in the method of suspension adopted in front, the springs being of a kind of Cee type. The length of wheel base and width of track have again been increased, and the engine is said to give 80-b.h.p. (as against 65-b.h.p. in last year's Paris-Vienna model). The change-speed-gear remains the same as before. Four forward speeds are available.

Three Gobron-Brillié 120-h.p. cars will take part in the Paris-Madrid race, two of which will be driven by Kœchlin and Rignolly, the third driver not being selected yet. They have a wheel-base of 3 metres and a track of 1 m. 34 mm. The engines, weighing 360 kilogs., have four cylinders, with two pistons in each, on the makers' well-known system. The inlet-valves are mechanically operated. The bore of the cylinders is 140 mm. and the stroke 220 mm. The main clutch is of a double-cone type, and a direct-through drive is obtained on the fourth speed. The cars are expected to attain a speed of 140 to 150 kiloms. per hour on the level. The company also intend running two 40-h.p. light cars, these to be driven by Comte de Maigret and M. Tavenaux. All these will use alcohol as fuel.

100 MILES TRIALS CERTIFICATES.

THREE cars, as given below, took part in these Quarterly Trials on the 14th instant. The route was from Down Street, Piccadilly, to Uxbridge Road Station, and then followed the usual test route on the Oxford Road to the 49½ milestone from London and back. The roads were dry and dusty, and weather fine.

The hills on which hill-climbing trials took place were:—

(*a*) The steep portion of Dashwood Hill, commencing at 33rd milestone and ending at danger board at the top, 1,180 yards, having an average ascent of 1 in 16·0, and including 352 yards of 1 in 10·9.

(*b*) One mile, including Dashwood Hill, commencing at 33rd milestone and terminating at 34th milestone, having a total rise of 241 ft. in 1 mile, including 275 yards of a gradient of 1 in 21·7 and 600 yards of a gradient of 1 in 11.

(*c*) Aston Hill on the return journey. Distance, 1 mile 1,100 yards, having a total rise of 385 ft., and including 1,910 yards of a gradient of 1 in 21.

Capt. H. H. P. Deasy, 217, Piccadilly, W. 22-h.p. 4-seated **Rochet-Schneider** car fitted with 4 cylinders, cooled by pump and radiator. Weight without passengers, 22 cwt. Petrol used, 6·187 gals.; water, 11 oz. Average cost of fuel per mile, at 1*s.* 3*d.* per gallon, ·92*d.* Speed, outward and return journey, up to the legal limit. Non-stop run throughout. Hill-climbing speed with four passengers up (*a*) 2 mins. 23 secs. = 16·9 m.p.h.; (*b*) 2 mins. 53 secs. = 20·8 m.p.h.; (*c*) 4 mins. 54 secs. = 19·8 m.p.h.

The Automobile Supply Company, 29, Great St. Helens. 12-h.p. 4-seated **Boyer** car fitted with 2 cylinders, water and radiator cooled, electric ignition. Weight without passengers, 18 cwt. 3 qr. Petrol used, 5·393 gals.; water, ½ pint. Average cost of fuel per mile, at 1*s.* 3*d.* per gallon, ·8*d.* Speed, outward and return journey, up to the legal limit. Non-stop run throughout. Hill-climbing speed with four passengers up (*a*) 4 mins. 42 secs. = 8·19 m.p.h.; (*b*) 5 mins. 57 secs. = 10·08 m.p.h.; (*c*) mins. 42 secs. = 10·05 m.p.h.

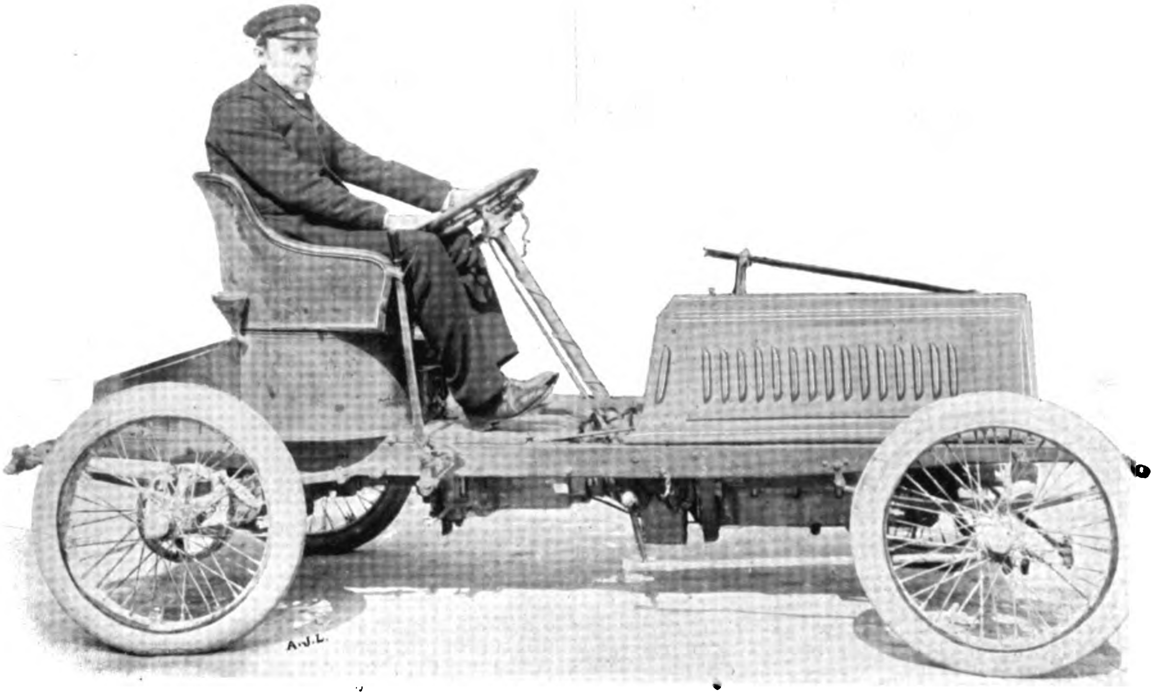
Weston Motor Syndicate, 14, Mortimer Street, W. 10-h.p. 4-seated **Chenard and Walcker** car, fitted with 2 cylinders, pump and radiator cooled, electric ignition, Chenard-Walcker single contact high tension. Accumulator and coil. Weight without passengers 15 cwt. Petrol used 1·68 gal.; water 1 qt. Average cost of fuel per mile, at 1*s.* 3*d.* per gallon, ·25*d.* Speed, outward and return journey, up to legal limit. Hill-climbing speed with four passengers up (*a*) 6 mins. 13 secs. = 9·65 m.p.h.; (*b*) 7 mins. 47 secs. = 7·7 m.p.h.; (*c*) 12 mins. 4 secs. = 8·08 m.p.h. One stop of 2 mins. 3 secs. for broken high-tension wire. Engine de-clutched and stopped down all gradients and re-started by letting in clutch.

Auto-Cycle Club.—The following members have been elected on the Committee of this Club: Professor C. Vernon Boys, F.R.S., Dr. Whitehall Cooke, M. G. Duncan, S. F. Edge, M. O'Gorman, J. Pennell, E. R. Shipton, Rev. Arundell Whatton, Robt. Todd, and C. A. Smith, as representing the Automobile Club; and Messrs. A. J. Wilson, E. Perman, G. F. Sharp, A. Candler, Master of Ruthven, and A. F. Ilsley, as representing outside members. Mr. Roger Wallace has been invited to become president. The club annual motor cycle race will be held on the Crystal Palace race track on August 22nd, as no suitable date in June could be found, this being the last day of the Motor Cycle Reliability Trials. The Reliability Trials for Motor Cycles will be held from August 10 to 22. About 100 miles per day will be run, starting from the Crystal Palace. Tuesday to Friday in the first week and Monday to Friday in the second week, inclusive, will be running days, one day of which will be given up to a specially long ride. Entrance fees will be £10 per machine, £5 of which will be returned to starters. There will be a private owners' class open to members of the Auto Cycle Club or friends introduced by them. No rider connected with the trade will be admissible to this class. Entrance fee, 2 guineas. The judges nominated are: Professor C. Vernon Boys, F.R.S., Master of Ruthven, D.S.O., Lieut.-Col. H. C. L. Holden, R.A., E. H. Cozens-Hardy, M.I.E.E., M. O'Gorman, M.I.E.E., A. J. Wilson, B. A. Hunt, Graham Murray, J. M. Gorham, J. D. Sutcliffe, Rev. Arundell Whatton.

MOTOR CYCLE TRACK RECORD.—On April 23rd, H. Martin, of the Croydon Motor Cycle Club, on the Canning Town Track, lowered Victor Rigal's standing mile track record of 1 min. 25⅖ secs. to 1 min. 24⅘ secs.

THE route of the Circuit de l'Argonne, taking place on July 19th, will be over a road of about 155 kilometres—which will probably be covered three times—and will include Flize, Boulzicourt, Yvernaumont, Poix, Bouvellennes, le Chesne, Quatre-Champs, Chestres, Boult-aux-Bois, Hanicourt, Buzancy, Nouart, Beauclair, Laneuville-sur-Meuse, Beaumont, Stonne, Tannay, Chémery, Frenois and Flize. There will be no neutralised portions, and the road selected is of a very trying nature, being entirely through a hilly district, rising in some parts to respectable mountains—probably over the entire course a flat kilometre could not be found—a veritable test of endurance and speed. From June 15th to July 11th entry fees will be doubled.

IN several directions commercial automobiles are making important progress in South Africa. Mr. Donald Menzies, engineer to the Dunlop Motor Company, has recently introduced a 12-h.p. Daimler lurry for transporting goods from Capetown to Clanwilliam, a distance of 156 miles. The lurry has been carrying 3 tons and covering the distance in 5 days for the up country journey, and 3½ days with a load of 1,000 lbs. on the return journey. The roads traversed are at present exceptionally bad and contain a considerable number of steep gradients. For effective handling of this traffic with the present bad state of the roads some higher-powered cars will no doubt be found necessary.

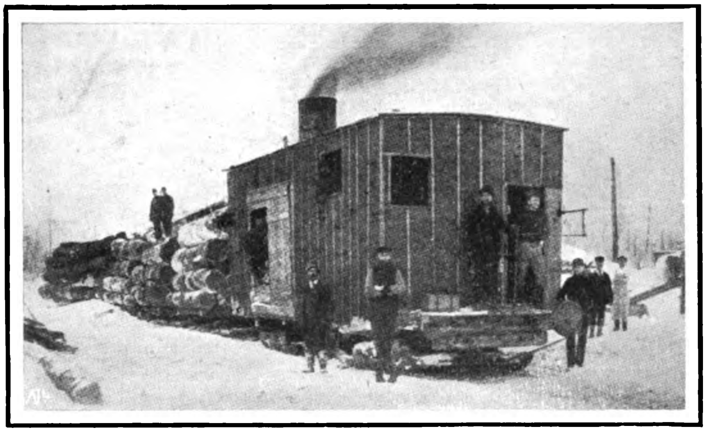


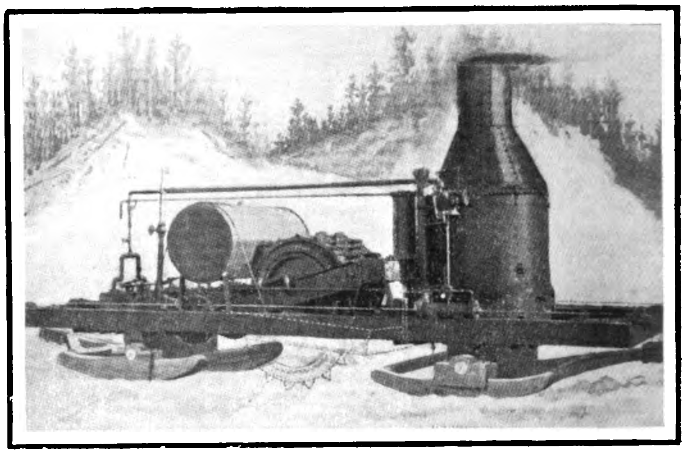
50-h.p. (1903) Darracq Car, driven by M. Baras. This vehicle, which has a stamped steel frame, and is fitted with a 4-cylinder Engine having mechanical inlet-valves, took part in the recent races at Nice. M. Baras will also drive this car in the Paris-Madrid Race.

The Motor Volunteers.—In addition to Mr. Mark Mayhew, who will be placed in command of the new Motor Volunteer Corps with the rank of Lieut.-Colonel, and Captain Skeffington Smythe, who has been appointed as Adjutant, Major-General Oliphant, commanding the Home District, has approved of the following appointments to the newly-formed Motor Volunteer Corps:—To be Majors: Honorary Colonel R. C. Knox, lately commanding 5th Battalion Irish Regiment; Mr. W. G. Windham; Honorary Lieutenant-Colonel H. H. P. Eden, late 3rd Battalion Norfolk Regiment, and Mr. N. H. Balfour. To be Captains: The Honourable C. S. Rolls; Mr. J. P. Hammond; Major A. H. Lee, late R.A; Mr. T. E. Polden, and Mr. W. J. Crampton. To be Lieutenants: Mr. H. Norman and Mr. J. E. Hutton. To be Second Lieutenant: Mr. H. P. Trippell, from the 1st Surrey Rifles.

Departmental Committee on Highways.—Mr. Grant Lawson, M.P., Parliamentary Secretary to the Local Government Board, presided over a meeting of the Departmental Committee on Highways, held last week, when the evidence of Mr. W. Rees Jeffreys, Hon. Secretary of the Roads' Improvement Association, was resumed. The witness advocated the adoption of the recommendation of the Royal Commission on Local Taxation in favour of an additional grant from the National Exchequer in respect of the maintenance of main roads, and the allocation of portions of the grant to the improvement of existing main roads and the construction of new trunk roads, and suggested that a Central Highway Department of State should be created to have control over highway administration throughout the country. He also urged the advisability of reducing the number of highway authorities by transferring the highway powers of Rural District Councils to the County Councils, and of simplifying the machinery by which land is acquired compulsorily for the widening and construction of roads; and concluded by pointing out the pressing necessity for the consolidation of highway law.

AT the meeting of the Aeronautical Institute, under the presidency of Dr. Barton, on Thursday of last week, an address of great interest to all concerned with aerial navigation was delivered by Mr. Octave Chanute. There is no greater authority on the subject than Mr. Chanute, and he differs from a great number of writers in having conducted a long series of experiments, and in having actually carried out a number of independent flights on machines constructed by himself. Mr. Chanute gave a general outline of the programme of the St. Louis Aeronautical Competition of 1904, with which our readers are already familiar, and then proceeded to deal with the more recent experiments of the brothers Wilbur Wright in South Carolina. Mr. Chanute pointed out to an interested audience that in all cases of soaring flight it is an indispensable condition that the centre of pressure and the centre of gravity should be in the same vertical straight line. In the machines of Lilienthal and others it was attempted to maintain this condition by shifting the body of the operator. Chanute himself and his fellow experimenters first varied the experiments by introducing means for restoring the condition of equilibrium, not by shifting the operator's position or centre of gravity but by altering the centre of pressure by manipulation of a tail. In all experiments previous to those of the brothers Wright, however, the operator had maintained a vertical position. The brothers Wright were the first to venture adopting a horizontal position, by which means the resistance offered by the operator's body to the air was reduced to about one-fifth of what it is in the vertical position. Their machine is, of course, well known to our readers, runners being provided on it underneath the operator's body to enable it to land with ease, and the tail being placed in front instead of behind. This, Mr. Chanute pointed out, was a very great improvement, as the tail in this position operates upon air which is as yet undisturbed by the passage of the machine. A graphic expression used by the lecturer in reference to wind will live in the memory of those who heard it: "The wind is not a steady flowing stream," he said, "as many people imagine, but a series of whirling billows of air." In a discussion which subsequently ensued, and in reply to Mr. Middleton, Mr. Chanute pointed out that there was no real distinction between the soaring flight of a bird and what the brothers Wright had accomplished, a very large number of their glides having been actually made at a positive angle of as much as 3 degrees with the horizon, so that for a considerable part of their course they were actually rising from the ground. While others go out to kill and destroy birds, said Mr. Chanute, the brothers Wright had expended their energy and leisure in attempting to imitate them, not for any purposes of gain, but simply as a sport, and it must be admitted, he said, that they are now able to accomplish quite as much as the buzzard. The time is within sight when, with the knowledge of manipulation that they are acquiring, it will really be a practical consideration to add a motor to their machine and attain continued independent flight. Mr. Chanute, however, does not consider that this time has yet arrived. It must, he thinks, be preceded by further experiment of the kind described.

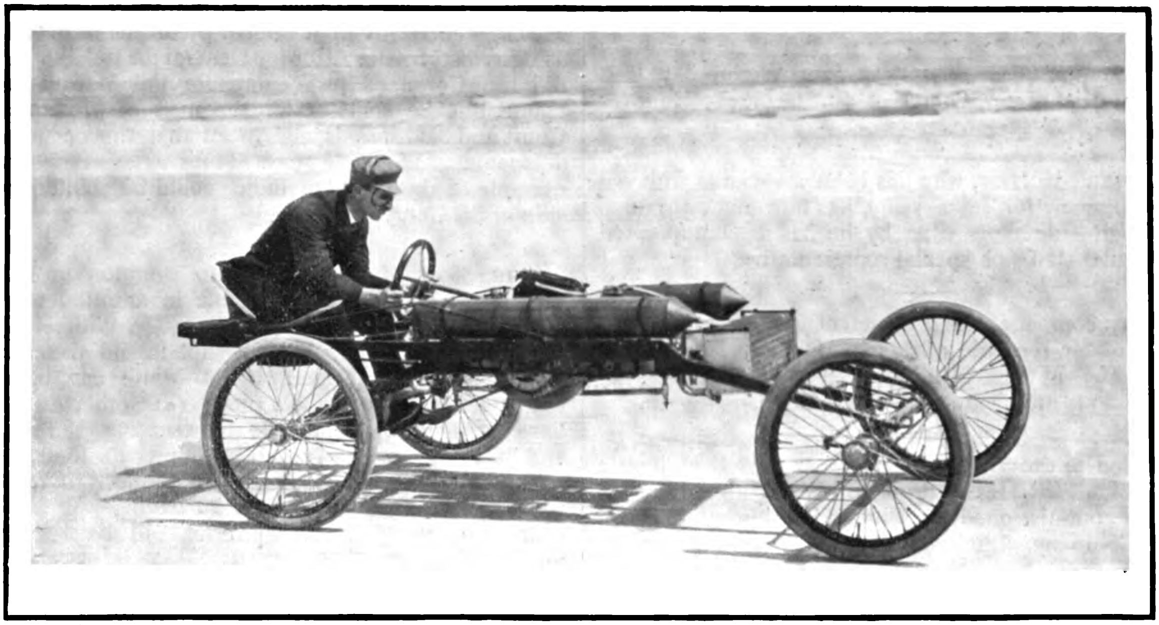




The Glover Tractor, which is shown above in use hauling logs in a Michigan pinery and is an American steam tractor for use on snow or ice, is equipped with a 200-h.p. steam plant, and is mounted on runners in front and behind. The machine is propelled by a toothed drum carried upon a hinged beam. The weight upon the drum can be varied by a steam cylinder which presses it down into the snow. The drum is heated to any required extent for softening the snow by the exhaust steam, and two "speeds" are provided in the mechanism driving it. Hydraulic steering apparatus is employed. The machine weighs 30 tons, and is said to be capable of hauling 150 tons at six miles per hour on a smooth ice track. On virgin snow the tractor is driven over the route alone first to make a hard track. Our illustrations are from the "Scientific American."

MR. CAMPBELL MUIR has this week driven his new car from Stuttgart, in Germany, *via* Strasburg, Paris, and Havre, to Guildford (crossing to Southampton) in 18 hours 45 minutes actual running time. The distance is 1,070 kiloms. (666 miles) and heavy rain was encountered most of the time.

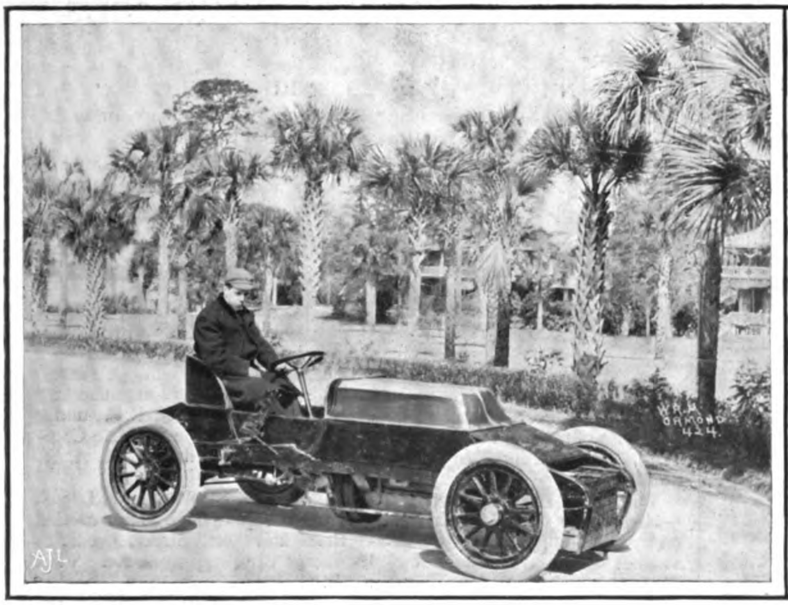
COL. PURCHAS, who is in control of that admirable institution, the Gordon Boys' Home, is making an excellent move in the interests of the inmates of the home. He is arranging to obtain a secondhand motor car, and proposes to select those youths who give promise of mechanical knowledge, and to initiate them into the details of the mechanism and driving of automobiles, thus fitting these youngsters for taking up positions as skilled automobile drivers and mechanicians. Any of our readers who can assist in this excellent purpose, particularly in respect to assisting Col. Purchas to obtain his instruction car, should communicate with him at the Gordon Boys' Home, Chelsea.



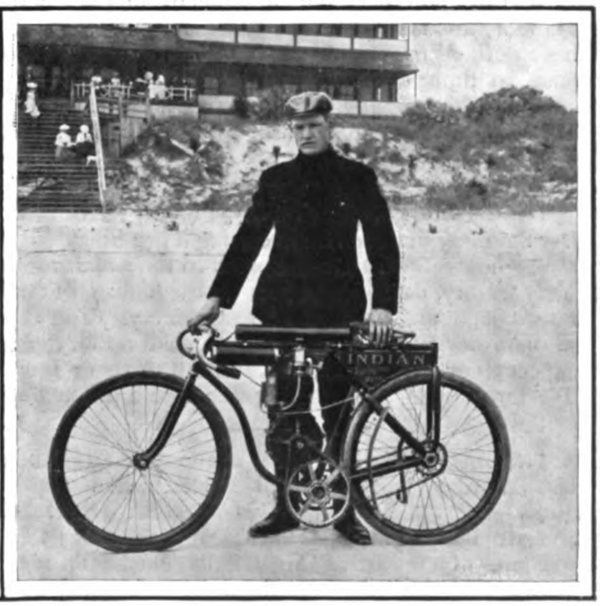
H. T. Thomas on the Oldsmobile "Pirate," which made the mile record of 1 min. 6⅕ secs. for 15-h.p. machines, in the Daytona-Ormond Beach Races.

THE King's Commission of representatives for the St. Louis Exhibition has been announced, the Prince of Wales being President, and the chairman Viscount Peel. The members include Sir W. H. Preece, Professor C. Vernon Boys, F.R.S., Mr. J. C. Hawkshaw, M.A., President of the Institution of Civil Engineers, Mr. W. H. Maw, President of the Institution of Mechanical Engineers, and Professor Boverton Redwood, F.R.S.

THOMAS TILLING, Limited, the large omnibus proprietors, announced at their general meeting held last week, that they are watching very anxiously the development of the motor car industry, and the chairman stated that they do not intend to be left behind when anything transpires which may be likely to be of use to them. They are not very much inclined at present to take any active steps in proving the superiority of motor traction over horse-drawn vehicles.



Alexander Winton on his "Bullet" car in front of the Ormond Hotel, during the recent Daytona-Ormond Beach Races.



Oscar Hedstrem and his "Indian" motor bicycle on which he made the American mile record of 1 min. 3⅕ secs.

For particulars of this meeting see "Automotor Journal" for April 4th and 18th.

IT is proposed to create a class of Associate Members of the Society of Motor Manufacturers and Traders.

MR. FREDERICK R. SIMMS was, on Wednesday last, married to Miss Lucy Greiss at St. George's, Hanover Square.

MR. OLIVER STANTON, who has been associated with the Daimler Company for some years, has now made arrangements with the directors whereby he has been appointed to their regular staff as a special representative.

A PRIVATE company with a capital of £150,000 has been registered under the title of Mark Mayhew, Limited, to take over Mr. Mark Mayhew's well-known business of millers and flour merchants in Church Road, Battersea.

IN addition to the Daimler petrol car and the electric phaeton which H.R.H. the Prince of Wales already owns, he has now commissioned the City and Suburban Electric Carriage Company, Limited, to build him an electric brougham.

THE Belgian Automobile Club are moving into new premises in the Place Royale, Brussels, on June 15th. Unfortunately, in their new house, which was at one time the residence of Baron Osy, owing to the close proximity of the Royal Museum they will be unable to instal a garage.

POLICE traps are cropping up all over the country. Amongst those which we hear of this week is one between Reservoir Hill and Lawnswood, on the Leeds-Otley road, another between Garstang and Lancaster, and a third between Hellifield and Settle, one mile towards Long Preston.

ACTING upon the representations of the Society of Motor Manufacturers and Traders, the Commissioners of Police have notified the Society that in future they do not propose to limit the quantity of petrol carried on public service vehicles, provided it is so stored as to afford the greatest possible protection to the public from accidental ignition, &c.

THE Beaufort Motor Company, of 14, Baker Street, were last Saturday unfortunate in having a fire break out in their power house. The flames spread to the wood working and body factory, destroying about 50 car bodies, but otherwise no damage was done to the machinery. The Company, who are working night and day to make up for the damage, expect to overtake their orders within three or four weeks. The engineering and erecting shops were untouched.

THE first meeting this year of the Aero Club took place last Saturday at the Crystal Palace, when two balloons ascended. The first carried Mr. Pollock, Dr. Hutchinson, and Mr. Baily, and came down near Rochester; the second balloon, which carried Mr. Leslie Bucknall, Mr. Frank Butler, and Mr. Percival Spencer, descended at Sittingbourne, after having had a narrow escape of landing on to the top of one of the men-of-war lying in the Chatham Dockyard.

THERE is a distinctly Irish flavour about the abandonment of the proceedings against the Marquis of Downshire for causing the death of a woman by means of his motor car, as described by the Attorney-General for Ireland. Not only did the Coroner's jury exonerate the Marquis from all blame, but the solicitor for the next of kin appeared in Court and said he was convinced that the occurrence was accidental. We have some doubt as to whether a similar example of absence of prejudice could be pointed to on this side of St. George's Channel.

THE Stock Exchange walk to Brighton on May Day promises to be a motor car picnic in addition to a contest of endurance for the competitors. Mr. William Bramson, who originated the walk, will superintend the event on a motor car distinguished by a white flag bearing the letters S.E.W., and quite a number of other automobilists have arranged to promenade the road between the starting and finishing point. It is to be hoped for the sake of the competitors that consideration in respect to raising dust will be given by automobilists and others, or we fear the chances of many of the sprinters will be reduced to a minimum.

THE Panhard Company have recently taken steps in France for preventing infringement of their patents, and it is significant to notice that the Company's English patents have now been assigned to Mr. Harvey du Cros, their exclusive Concessionaire in this country. It is, therefore, probable that a sharp look-out will be kept upon any manufacturers who may infringe such patents as are owned by them, and that even the use of the word "Panhard" for describing devices of a similar character to those made by the famous French firm will be largely checked. We presume that one of the chief patents referred to is that controlling the "Krebs" carburettor.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Forman Motor Company (Limited), Day's Lane, Coventry.—Capital £2,500 in £1 shares. Object, to adopt an agreement with C. E. Forman, and carry on the business of manufacturers of motor engines, motor-propelled vehicles, &c.

Gare Patent Tyre and Wheel Company (Limited).—Capital, £12,000 in £1 shares. First directors are T. Gare (managing director), J. H. Heblethwaite, and F. Frith.

Steam Generators (Limited), 34, Clements Lane, E.C.—Capital, £12,000 in £1 shares. Object, to adopt an agreement with A. Lafargue and others.

Souhami and Co. (Limited).—Capital, £4,000 in £1 shares. Object, to take over the business of a veneer merchant and manufacturer of and dealer in cycles and motor cars, at 372, Old Street, E.C., under the styles of Souhami and Co. and the Hackney Motor and Cycle Company. First directors, L. J. Souhami, N. Lazarus, and Mrs. M. A. R. Souhami.

Walker Brothers (Leeds) (Limited), 70, New Briggate, Leeds.—Capital, £1,000 in £1 shares. Object, to acquire the business carried on by S. Goldthorpe at Meanwood Road and North Street, Leeds, as Walker Brothers, repairers of cycles, motor cars, engineers, &c. First directors, S. Dobson (chairman) and R. G. Place.

West Sussex Motor Company (Limited).—Capital, £5,000 in £1 shares. Principal object, to establish a service of motor cars between Bognor and Chichester. First directors, M. F. Mieville, H. Lovett, and T. S. Adcock.

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THE AUTOMOTOR JOURNAL

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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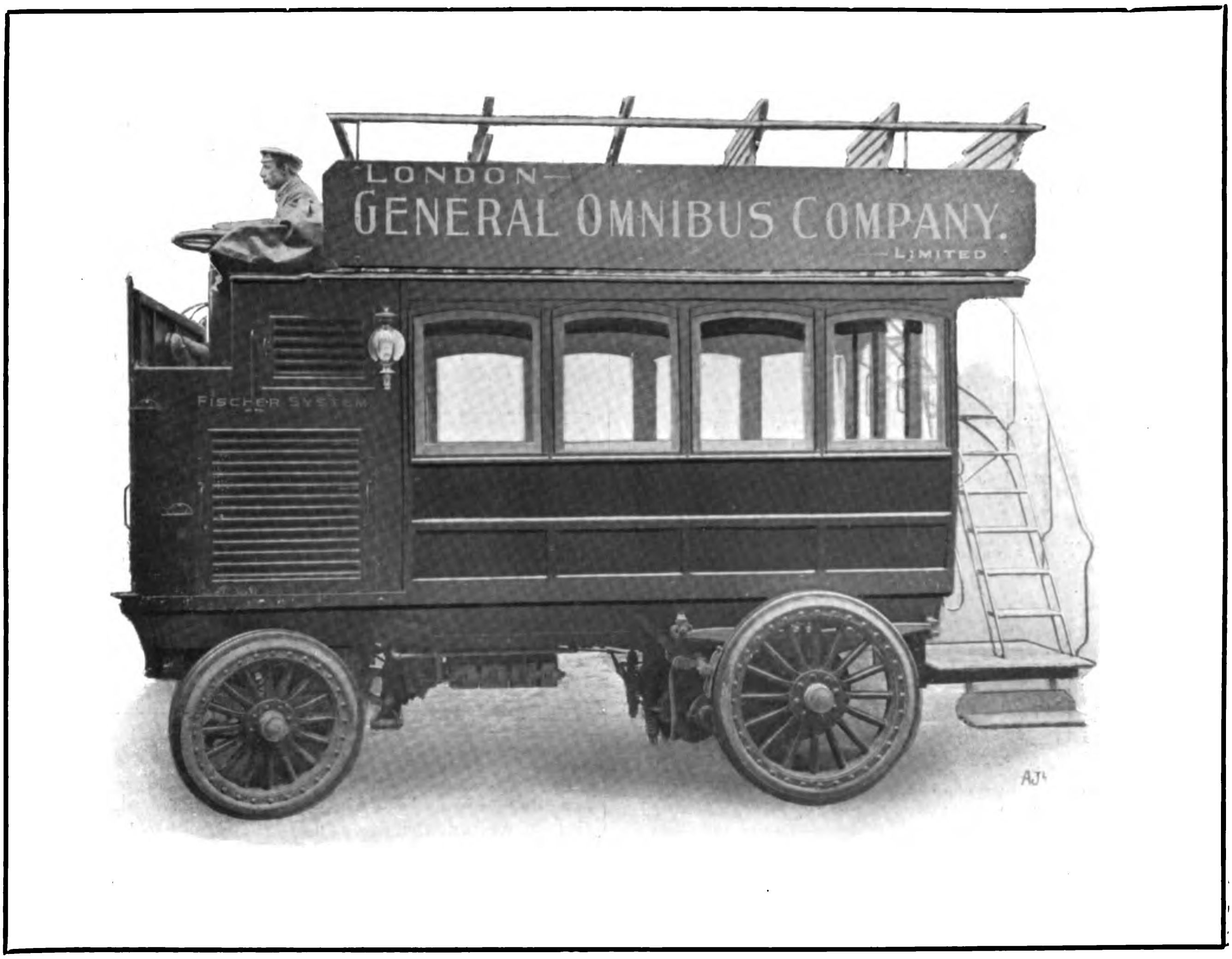

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DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
May 11, 18		"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Society of Arts, Cantor Lecture).
May 13-14		Glasgow to Leeds and Leeds to London Non-Stop Run (Scottish Auto Club).
May 16		Sheffield A.C. Hill Climb, Padley Wood.
May 23		Scottish Auto Club Hill Climb.
*June 13		Gymkhana at Ranelagh.
June 20		Manchester Auto Club Hill Climb.
July 1	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2		Gordon-Bennett Race.
July 3		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4		Speed Trials, Phœnix Park.
July 6		Tour to Newcastle and Belfast.
July 7		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy.
July 8		Return to Dublin.
July 9		Start for Cork.
July 10		Arrival at Cork.
		Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13		Start of Tour through the South.
July 14		Arrival at Killarney.
July 15		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
July 24-25		Southport Speed Trials.
*August 10-22		Tourist Motor Bicycle Reliability Trial.
*September		The 1,000 Miles Trial.
1904.		
		*Light Van Trials.
*Feb. 12-24		Crystal Palace Exhibition.
May.		Electrical Vehicle Trials (6 days).

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
May 9-14	Belgian National "Circuit."
May 14	Paris-Madrid. Start of Tourist Section.
May 16-24	Stockholm Exhibition.
May 18	Speed kilom.—Geneva (Swiss A. C.).
May 24, 25, 26	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May 25-30	Hanover Alcohol Van Trials (German Agricultural Society).
June 18, 19, 20	Automobile Club Fêtes—Paris.
June 18-28	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21	Circuit des Ardennes.
June 28	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 12-19	Ostende Automobile Week.
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16	Race Trelex-Saint-Cergves (Swiss A. C.).
Sep. 6-13	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September	Udine Exhibition (Italy).
Oct. 15-21	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

LEGISLATION AT LAST.

THE Government have at length decided to bring in a Bill designed to reform the existing motor-car law. The Bill is definitely promised, Mr. Long having stated on Tuesday last, in reply to Mr. Ellis, that he had in preparation a Bill on this subject, and hoped *shortly* to be able to introduce it. We have always anticipated this step being taken by the Government at an early date, and have always said so. In fact, when dealing with Earl Russell's proposed Bill, we pointed out that in our opinion his assumption that the Government would not introduce a Bill at an early date, and that, therefore, the situation was neither pressing nor critical, was misleading. In this respect Earl Russell has not shown himself a reliable or perspicacious guide.

Mr. Long naturally refuses to disclose the particulars of his Bill before it is introduced. We trust that it will provide for the complete abolition of the speed limit, though rumours are prevalent that it only extends the limit. In the latter case it would be of little benefit to automobilists owing to the nature of police evidence, and the manner in which they get up their cases. On the other hand, we feel convinced it will include provisions for numbering or other means of identifying vehicles. There is little doubt that the Bill will be introduced at an early date, and the position, therefore, is critical in the extreme. The Automobile Club, and the automobile world generally, are at present being invited to consider two rival proposals. What is practically a crisis has been precipitated by Mr. Long's action, and we, therefore, think it extremely unfortunate that two alternative proposals have been put before the voters. We dealt at length in our last issue with the rival merits of the proposed Bills. In view of the Government Bill soon to be introduced, we can only repeat, as we have said before, that it is of the highest importance that the automobile community should speak with no uncertain voice.

We hope to see it practically unanimous in favour of proposals which recognise the necessity of giving something as well as taking something—giving something, that is, which is demanded by the authorities. If there is anything like an equal division of votes, the result will be to seriously tie the hands, and cripple the action, of those who represent the interest of automobilism in the House of Commons. Whatever provisions the Government measure may in the first instance include, some of them may be struck out, and others added in Committee. It rests with the House, therefore, in any case, once the Bill is introduced, to make or mar it—to turn out a measure that will give general satisfaction, or to provide a statute which will give neither relief to automobilists nor protection to the public. For the sake of automobilists it is of the highest importance that those who are representing their interests in the House should have authority in dealing with the subject in Committee as the representatives both of a united and a reasonable body of men, otherwise their arguments will be little listened to and probably treated with scant consideration.

It is for this reason that we particularly regret that at this crisis two alternative measures are inviting the suffrages of the automobile world. We have already expressed our general disagreement with, and objections to, Earl Russell's measure, and our general agreement with Mr. Scott Montagu's, that is to say, the Club Committee's Bill.

It is extremely desirable that the votes may show an overwhelming majority in favour of the latter measure, as actual unanimity is, of course, too much to hope for. We have pronounced in favour of the latter measure, but we desire to repeat once again that in that measure we wish to see included the safeguards on which we have repeatedly insisted, and chiefly and principally, and first and last, that provisions be introduced for necessitating the independent confirmation of police evidence in all motor car cases. This is so all-important that it cannot be too often insisted upon. It is really the *crux* of the whole question.

THE LORD JUSTICE CLERK OF SCOTLAND AND THE LEGISLATION PROPOSALS.

No growing industry can point amongst its votaries to a larger proportion of conspicuous independent talent than the movement which we assist in representing. Not only do we number in our ranks the most exalted personage in the kingdom, but we have the Prime Minister and men distinguished in nearly every walk of life, conspicuous among whom are some of our great judges, notably Sir Francis Jeune and the Lord Justice Clerk of Scotland. Both of these latter gentlemen have at different times delighted the members of the Automobile Club with humorous and racy accounts of their automobile experiences. The Lord Justice Clerk of Scotland, Sir J. H. A. Macdonald, has not only been a familiar figure at many important automobile events, but he has quite recently received a silver medal of the Royal Scottish Society of Arts for several useful improvements made by him in connection with automobiles. He has the fullest right to be heard on any subject connected with automobilism on which he desires to address the public, and we have pleasure, therefore, in drawing attention to the courteous letter appearing in our correspondence columns, in which he takes some exception to our article on the legislative question, published last week. The Lord Justice Clerk desires to draw a sharp distinction between the proposal to identify motor vehicles by means of numbers, and by means of registered names, which should be as legible, of course, as the numbers.

Readers of our article will see that we practically treated the two methods of identification as identical with one another, in fact, that we used them as alternatives throughout, and only in the concluding paragraph alluded to numbering by itself. We considered that we had previously conveyed to the reader the impression that we regarded these two methods of identification as being one and the same thing from the point of view maintained by us. Of course, the question of numbers *versus* names is largely a matter of personal taste or sentiment, and we agree that the latter are less objectionable from that standpoint. Whether the authorities would regard names as being equally convenient and satisfactory is another matter. All we think really necessary is that means of ready identification should be at hand which will enable a car which refuses to stop to be identified, provided, of course, the safeguards on which we have repeatedly insisted are embodied in the proposed legislation. For our own part we do not think it is an overwhelming drawback to have to carry either a big number or a big name, provided that is the price which has to be paid for getting the speed limit abolished and the law otherwise put on a satisfactory footing. It may even be that a time will come when it will be regarded as a distinction to be the bearer of one of the earlier numbers.

DIFFERENT WAYS OF ADMINISTERING THE LAW.

The rational and considerate behaviour of the Nottinghamshire police, on the occasion of the Welbeck eliminating trials, has been the occasion of favourable comment in the Press. The police of this county adopted the sensible procedure of stationing themselves at villages, dangerous corners, and other places where high speed was likely to endanger the "life and limb" of such passengers as *really were* on the road (Mayhew *v.* Sutton), and refrained from adopting those not very straightforward tactics which the mind of the average Englishman, whether automobilist or not, finds considerable difficulty in approving of. In plain English, there were no police traps, with constables disguised (easily) as yokels, or hiding in pigsties or the like undignified sites, attempting, not to stop dangerous speed, but to entrap persons who have unwittingly exceeded the speed limit. Any law can be made ridiculous by inconsiderate administration, just as it is impossible to adequately enforce any law against which the opinion and will of the great majority of the community are arrayed. The proper function of the police is not to connive at breaches of the law, with a view of apprehending the law-breaker subsequently, but to prevent, as far as possible, breaches of the law from taking place. However much we may look forward to the effect of enlightenment and diminution of prejudice bringing this result about, we must bear in mind that the un-English tactics in question, of which all automobilists very properly complain, are, in the case where they are adopted, the result of the monstrous system which permits the fines provided by police-court convictions to be used so as to form a practical "grant" in aid of the local rates. Naturally, in counties where things are prosperous and the rates not excessive, the authorities are less anxious to profit by this rather disreputable source of income than in other less favoured districts, but, as we have on more than one occasion pointed out, the way really to abolish what we consider a quite improper administration of the law, is to bring in a Bill to remove this abuse. When the joint Committees and their friends cease to profit by fines inflicted on automobilists they will allow the police to return to their proper duties and protect (amongst other things) the cabbages of Lord Onslow and the cottages in his neighbourhood. The purpose of the police trap is so ridiculously obvious. If it were really merely desired to stop rapid driving, a couple of constables 100 yards apart could do the job perfectly; the first might warn the car, employing a signal which the second would see, and if, after that, the car driver refused to moderate his pace, the second constable could bring him to a standstill and summon him. In 99 cases out of 100, however, this procedure would not result in a fine, so, in order to obtain the fines, the police are disguised—as above pointed out—thinly, and constrained to adopt undignified tactics and situations.

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REACTION.

It seems quite terrrible to call to mind that there were times, and not so very long ago either, when certain revolutionary firebrands seriously proposed to do away with the House of Lords. Of what a fund of humour (sometimes unconscious) they would in their ardour of reform have deprived the nation! Amongst other things, we should never have had to chronicle the onslaught made upon automobilism last week by Lord Lamington. Lord Lamington desires that the Government should make a report of all accidents up to January 1st last due to motor cars causing injury to person or property "other than that of the occupants of the cars themselves." Why the exception? Are automobilists to be regarded as *hors la loi*? Lord Lamington waxes quite threnodic over a country village he knows of which, although situated upon a main road, was once comparatively retired and quiet. Now, owing to motor cars passing through the village, the people live, according to this reactionary nobleman, in a state of permanent terrorism. It is really terrible to think of the rustics of this hamlet, who have been for generations accustomed to cross the high road with bovine leisureliness, being hurried in their strides by the new locomotion. They will, if the present horrible state of things continues unchecked by the police, ultimately, in spite of themselves, become quite quick-witted. Lord Lamington reminds us that there is a party in the country that still believes the unintelligence of the agriculturist to be one of the principal pillars of the State. We do not really need a better testimony to the educative effect of the automobile than that supplied by the case of Lord Lamington's "sleepy hollow." The inhabitants will have to commence to think and observe there soon. Lord Lamington is of opinion that the present regulations are not nearly stringent enough as regards automobilists. He tells us that Parliament laid down stringent regulations with regard to railways, though the railway companies had to make their own roads. We do not know that Parliament has ever limited the speed of railways, and there are railways that the Board of Trade has stirred up for not being speedy enough. Lord Lamington, we think, has been born, by an untoward fate, at a wrong period in the world's history. He would have been much more in touch with things in the good old days when "my Lord Castlewood and my Lord Mohun journeyed from London to Cambridge and lay two nights on the road, before the new fast coaches were established which accomplished the whole journey in two days."

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It is only fair, however, to Lord Lamington and the Upper House to point out that a similar attack was also made in the House of Commons, curiously enough by a namesake of the Prime Minister, demanding in the interests of the public that motor cars should be suppressed as far as possible and at any rate numbered and licensed, "owing to the inconsiderate driving of a small number of automobilists." Both Mr. Balfour, in the Commons, and Lord Lamington, in the Lords, were very pathetic over the wrongs of the other users of the roads; but really, as we have pointed out again and again, except for tradesmen's carts and automobiles, the country roads in large districts of England are practically deserted. How many vehicles, we should like to know, pass over Dashwood Hill to the hour, or for that matter to the day, except when there is a market at High Wycombe.

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TRAMS WITHOUT TRAMLINES.

We have never attempted to conceal the fact that our admiration for trams, and particularly tramways, whether the traction is by horses or electricity, is far from enthusiastic. It must be recognised, however, that apart from the manner in which they block already often over-crowded streets, occasionally take the wheels off ordinary vehicles, and but too often occasion side-slip in bicycles and automobiles, they perform a useful function in the world's economy. They convey large numbers of the working classes to and from their daily avocations. When the streets are not blocked the electric trams, at any rate, get along at a very fair pace; in fact, they are practically the poor man's automobile in suburban districts. Those tramlines that are already built we must, therefore, agree to include in the great category of "those ills we have." It is their further extension to which we are, in the interests of automobilism generally, unless special roads are made for them, strongly opposed. There are two great objections to the tram as at present constructed. One is the tram-lines themselves, which, however evenly with the general road surface they may originally be laid, sooner or later always cause trouble to other vehicles, by either rising above or sinking below the general road level for longer or shorter distances. This, of course, causes annoyance and often danger to other users of the road. The other objectionable feature of the existing tram is its unyieldingness. The tram goes along on its track, unable to turn either to the right-hand or to the left. All other traffic, therefore, has to get out of its way, and it is unable to move even an inch to let other vehicles pass it, and that inch often means the blocking of a whole line of street. Various attempts have been made in different parts of the Continent to preserve the advantages of the electric tram without the corresponding troubles and inconveniences. This has been attempted in certain cases by constructing omnibuses electrically driven, the current being supplied to them, as in tramway practice, by a system of overhead conductors, with trolley poles on the vehicles. Such vehicles can run along ordinary roads if only a system of overhead conductors is installed. The service does not involve any interference with the roadway, and possesses the great advantage that within considerable limits the omnibuses can go where they like, and can yield to one another, and to the general traffic of the road without difficulty. The first of these electric omnibuses was built by Messrs. Siemens and Halske, and was described in the JOURNAL (Vol. IV., p. 600). The extent to which the system has been adopted on the Continent is, however, not generally known in this country, and Mr. G. J. Wilkinson, who read a paper at a meeting of the Lincoln Chamber of Commerce, on April 30th last, did a public service in giving a quantity of interesting data on the subject as derived from the working of what is apparently the most successful line of the kind in the Bielethal in so-called Saxon Switzerland. On this road both passenger cars and, at times, heavy goods wagons are run, the latter sometimes conveying a trailer, and attaining a speed of as much as eight miles an hour. Two overhead conductors are necessarily employed, as, owing to the absence of rails, a second conductor is required for the return current. The trolley poles on the vehicles are so arranged that the 'buses themselves can deviate ten feet on either side of the overhead wire without losing touch of it, and this is generally ample to enable them to accommodate themselves to the other traffic of the road. Of course, any overhead method of suspension suitable for tramways can be employed, but the great point is that the cost of equipment for these overhead fittings, including poles, &c., averages about £1,000 per mile, while the cost of laying down permanent way comes out at from £4,000 to £5,000 per mile. As regards the original expense incurred, therefore, everything is in favour of the railless trams.

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THE satisfactory working of the Saxon line opens up the prospect of enabling all the advantages of tramline extension to be obtained without causing inconvenience to other users of the road, or nearly as much blocking of traffic in crowded districts as occurs in the case of existing undeviating trams. It is satisfactory to learn, therefore, that Mr. C. R. Bellamy, manager of the Liverpool Corporation Trams, is putting forward proposals for the adoption of this system in his district. According to Mr. Bellamy, the amount of energy required for driving the vehicles on roads without rails is, as one would expect, greater than in the case of trams, but the difference is more than compensated for by the absence of upkeep of the permanent way. Mr. Bellamy, however, puts the consumption of energy at 120 watt-hours per ton-mile for the tramcars and 200 watt-hours per ton-mile for the railless omnibus. We heartily congratulate both Mr. Bellamy and the Liverpool Corporation on their decision to adopt this very valuable suggestion from abroad. The tendency of the age is towards decentralisation. Next to the adequate organisation of a completely independent service of motor omnibuses, the railless tram system has most to recommend it. It is much to be preferred to the extension of tramlines. It will do all that the trams could do, it will not cost so much, it will not annoy the drivers of other vehicles, particularly automobilists, to anything like the same extent, and it will not block the traffic nearly as much, while it will afford the same facilities to the working classes and others to live in fresh air away from their work. It is, of course, not quite as ideal as a system of independent motor omnibuses, but it is a movement in the same direction, and is very likely to have the effect of promoting their general introduction.

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WE would venture to recommend to Mr. Bellamy, before his scheme is fully worked out in practice, that considerable advantage would be obtained by carrying a small battery of accumulators on each of the cars. This is what was done, as our readers will see by referring to the reference we give above in the case of the original Siemens and Halske omnibus. The accumu'ators fitted to that vehicle were capable of running the car about 20 kiloms. when fully charged, and they received current from the overhead wires (until they were fully charged) while the vehicle was running. The batteries supplied need not be capable of running the vehicles anything like as far as that. If they are only capable of running them a mile or two it will be quite sufficient, but the addition of the batteries arranged to be charged in this way while the vehicle is running would enable the cars to leave the trolley wires altogether for a considerable distance, if necessary, to pass traffic on the road or other cars, and then take up the line again when convenient.

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SOMEBODY in the United States seems to have had his sarcastic faculties—organs which are well developed in most citizens of the great Republic—stimulated by the praise which has been frequently bestowed on the combined petrol and electric vehicle, so he has been describing an imaginary petrol and steam combination. He suggests having two motors, one a petrol motor and the other a steam motor, mounted "tandem" on the same car. What "tandem" may mean in this connection the Encyclopædia Britannica probably could not tell us, unless, perhaps, that the exhaust heat of the petrol engine is used to raise steam for the steam engine. "At any rate," says the humorist, who appears to joke with some "deeficulty," "the proprietor can always depend upon reaching his destination, for if one of the motors breaks down the other will pull him through." This conclusion strikes us as a *non sequitur*, for if one broke down it might be the cause of the other breaking down also. We think a gas motor ought to be added, for we have no doubt whatever that the talented inventor would always be able to supply enough gas to get home on, and, perhaps, float a British-American syndicate on this side of the "herring pond" as well.

THE ROCHET-SCHNEIDER 16-20-H.P. PETROL CAR—1903 TYPE.

THE latest Rochet-Schneider model stands out prominently amongst the best made and most up-to-date petrol vehicles of French manufacture. It was one of the new designs shown at the last Automobile Exhibition in Paris, and its leading characteristics were, at the time, mentioned by us in our series of articles dealing with that event. The English agency for the manufacturers having recently been taken up by Capt. H. H. P. Deasy, at 217, Piccadilly, we are now able, after having made a closer examination and a practical test with one of these cars, to give illustrations and a more detailed description of it.

Although in general respects the Rochet-Schneider model is designed upon the same general lines as other well-known vehicles, and although in the matter of mechanical inlet valves, low-tension igniters, and honeycomb radiator, it follows what is now a fashionable lead, yet it also possesses several distinctive features of its own. One noticeable deviation from ordinary practice is that the spring which normally holds the main clutch in engagement is stationary, instead of being mounted about the clutch itself; it can, therefore, be adjusted more readily,—even when the engine is running. Another unusual characteristic is that two water-cooled brake-drums are mounted on the countershaft, both of them being secured to the outer casing of the differential gear. One is placed on each side of the gear-box, and they are operated by independent foot pedals. Another interesting point is that the ends of the countershaft are carried in ball bearings, which support them close up to the driving sprocket-wheels and are held in place by a single nut in such a manner that they are not only easily removable, but are, to a great extent, self-aligning. The arrangement of the change-speed-lever differs materially from that adopted on other vehicles, although it is more in accordance with Mercedes practice than with the majority of others. It is fixed further forward than usual, and is of a curious bent shape. It can be moved towards or away from the driver in either of two parallel slots, and can be moved sideways from the one slot into the other, when it is in its central position. In the one slot, and when pushed forward, it gives the first speed; when drawn backwards in this slot it introduces the "reverse." When moved into the other slot, which extends considerably further forward than the one already mentioned, the second speed is obtained by drawing the lever towards the driver, and the third and fourth are brought into play, successively, by pushing it forward. Captain Deasy has added a very neat safety catch to prevent the "reverse" from being introduced unwittingly; the catch can be withdrawn by the driver pressing upon it with his foot. These are the more important distinctive features of this car, but there are several minor respects in which originality is also met with; these further details will be referred to in the course of the description which we give below.

A complete vehicle is shown from different points of view in Figs. 1, 2, and 3, in one of which Capt. Deasy himself is seen sitting at the wheel. The car is provided with a phaeton body, seating four, in which access to the back seat is obtained by hinging up the left half of the front seat. By using this type of body a very large space, which is utilised as a tool-box, is available. The accommodation provided in this way, beneath the back seat, is clearly shown in Fig. 3. The Company are only manufacturing this one size of vehicle, and have, therefore, been able to equip their works with machinery more entirely suited for the purpose than if they were attempting to build several different types. The chassis is so arranged that the mechanism, including the regulating levers and pedals, is entirely distinct from the body, and can, therefore, be fitted with any type of carriage body.

The main frame is built up of wood with steel stiffening plates, and a separate underframe, constructed of angle steel, is provided for carrying the engine and the change-speed-gear. The main frame is supported upon semi-elliptic springs in much the usual way, and both the axles are of specially strong construction. The wheels, which are of the artillery type, run upon ball bearings; they are of equal size, and are usually fitted with Clipper-Continental tyres, 910 mm. by 90 mm. The wheel base of the car is about 7 feet 8½ inches, and the track about 4 feet 5 inches. The arrangement of the engine and the transmission gear is the same as on many other vehicles in which side chains are used for transmitting the power from a differential countershaft to each of the rear wheels; there is, however, a considerable length of shafting between the main clutch and the gear-box on the first-motion-shaft, and the large chain-wheels are fixed to the road wheels by bolts which pass through every spoke. The chains employed are of the twin roller type. The steering pillar passes through and is fixed to the dashboard; the type of gear used is of the worm irreversible type, and is enclosed in an oil-retaining casing. The levers and rods connecting it with the wheels are fitted in accordance with the most recent practice, and are of ample strength.

The four-cylinder engine, fixed in place in the car, is seen from each side in Figs. 4 and 5, and two views of it are also given in Figs. 6 and 7, the first of which shows it from the inlet valve and igniter side, and the latter from the front end. The engine gives 22 brake h.p. although nominally it is of 16 to 20-h.p. The bore of the cylinder is 100 mm., and the stroke is 150 mm.; the range of speed is from 150 to 1,000 revolutions per minute. The cylinders, which are cast in pairs, are provided with mechanically-operated inlet-valves on the right side, and exhaust-valves of precisely the same size on the other side. The valves are operated, as usual in engines of this kind, by two separate cam-shafts, which are enclosed in the upper crank-chamber casting, and are driven by spur-wheels from the crank-shaft. The two gear-wheels on the ends of the cam-shafts mesh with one another instead of being separately driven from the half-sized wheel on the crank-shaft, as they generally are. These gear-wheels are built up of brass and fibre in order to render them as silent as possible; the fibre forms their central portions, and the brass lies on each side of it.

Low-tension igniters, A, of the make-and-break type, are fitted vertically above the inlet valves. Those for each pair of cylinders are held down by a single nut and a yoke-piece, and can, therefore, be removed in a few moments; the igniters in this way serve the same purpose as the inspection plugs, H, which are fixed in a very similar manner above the exhaust valves. The igniters are operated by cams mounted on the same shaft as those which lift the inlet valves; these cams cause the vertical spindles, B, to oscillate in their bearings and to actuate the igniters through

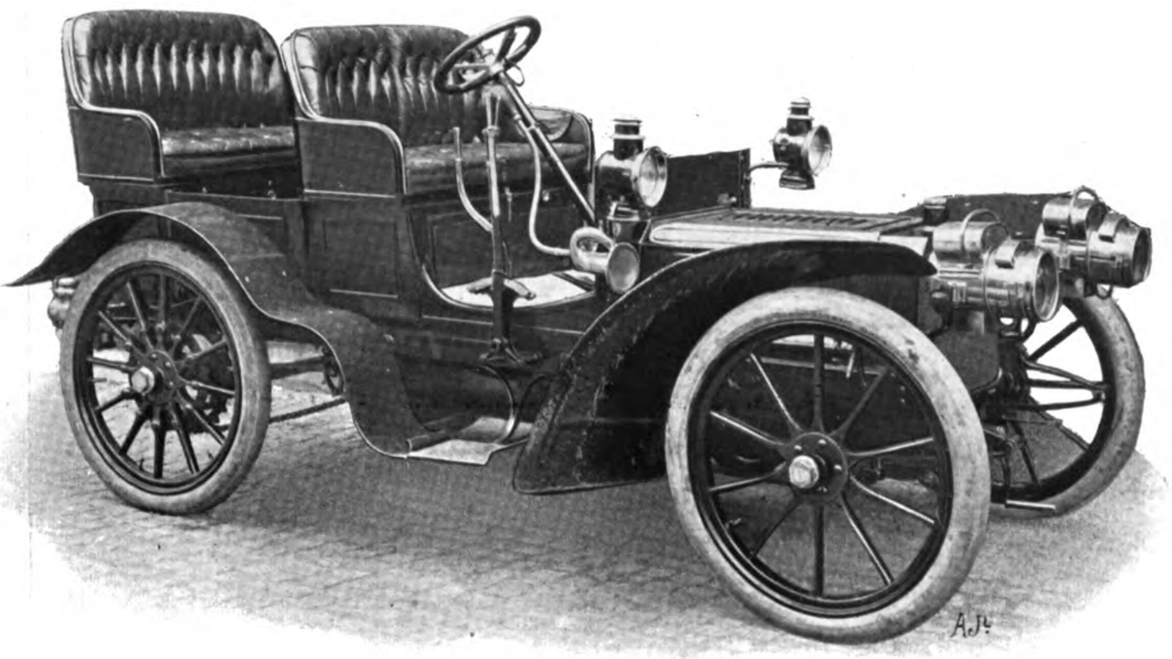


FIG. 1.—A Rochet-Schneider Phaeton (1903 type).

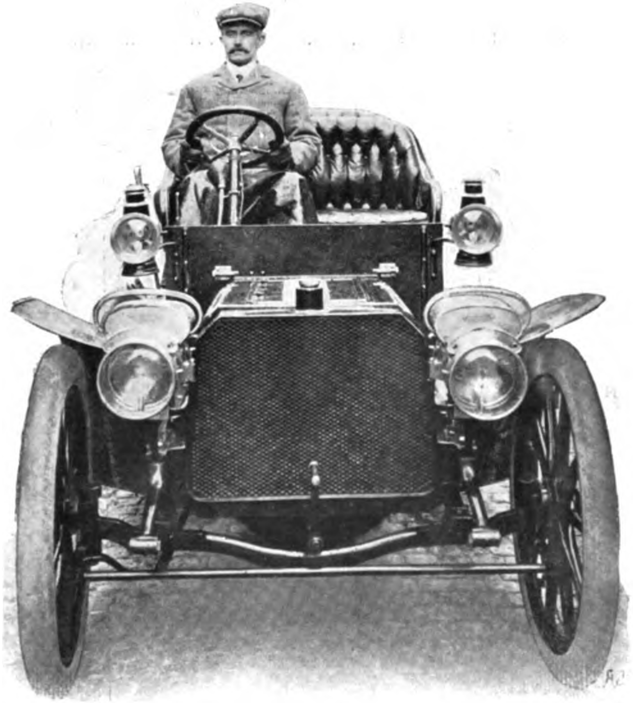


FIG. 2.—Front view of Rochet-Schneider Car. Capt. H. H. P. Deasy driving.

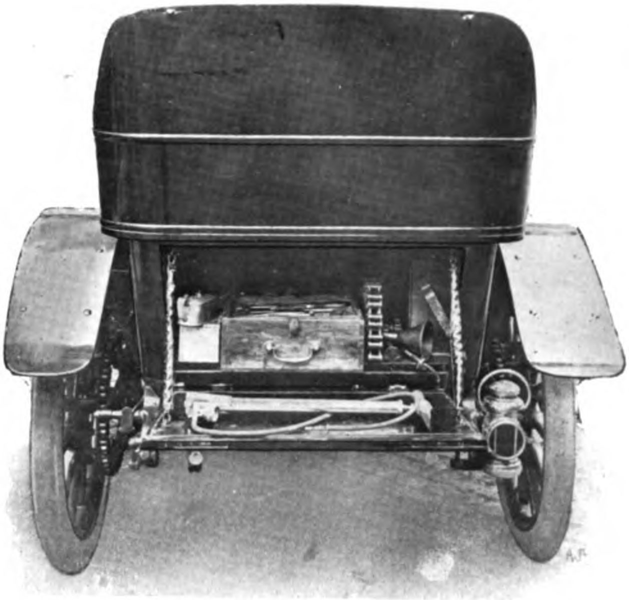


FIG. 3.—Rear view of Rochet-Schneider Phaeton showing Tool-box open.

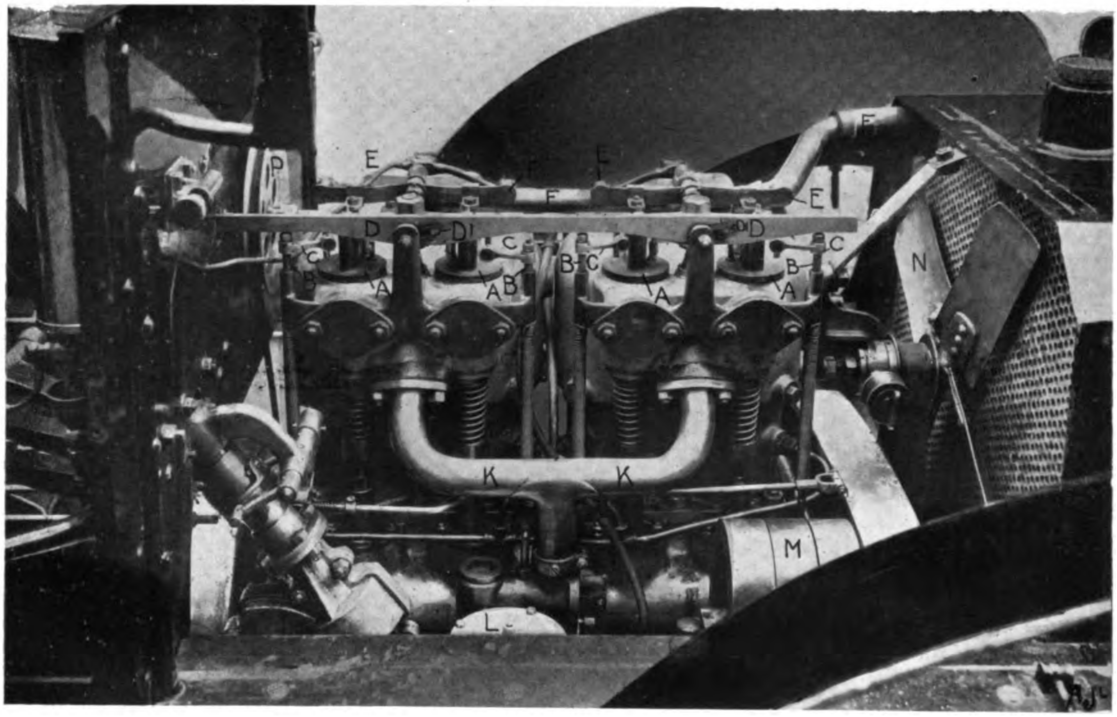


FIG. 4.—View of Engine in position from right side of Car.

the projecting arms, C, which are fixed to the upper ends of the rods, B. The cams are so shaped that they bring the moving portion of the igniter into contact with its insulated fixed portion and allow it to fly back under the influence of a long spiral spring, which is seen in the illustrations to surround each of the spindles. The time of ignition is varied by a small horizontal lever which moves over a toothed quadrant fixed just behind the dash. The hand-lever moves the bar, D, which is supported by pins passing through slots, D^1, in it. These slots are cut at

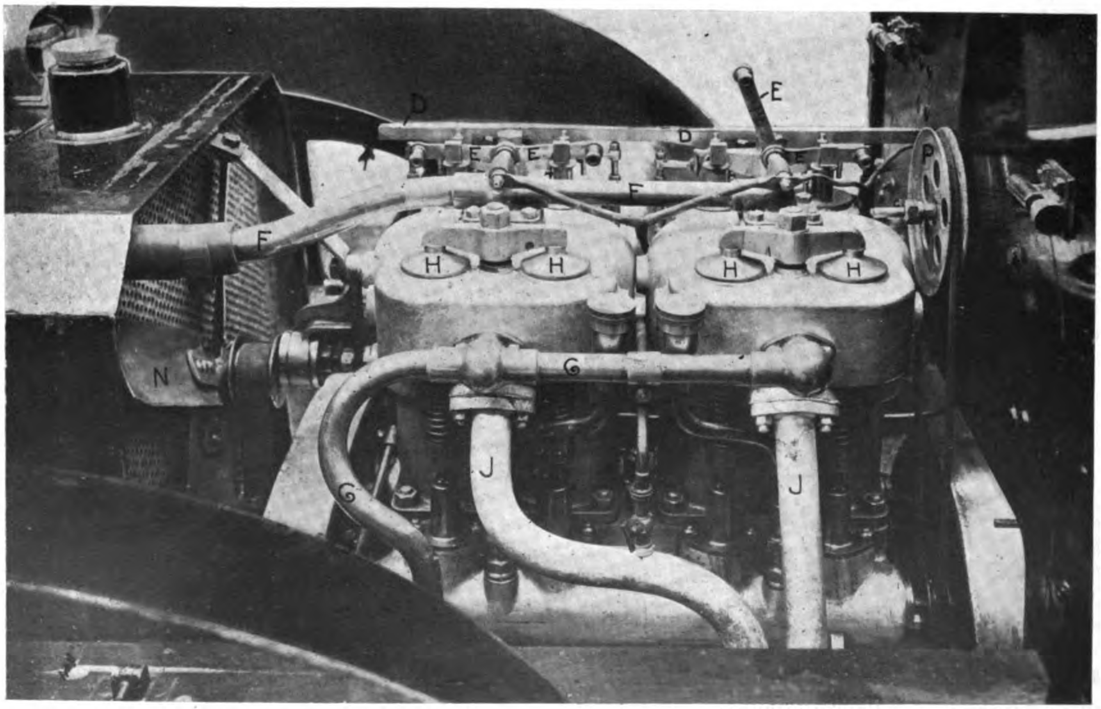


FIG. 5.—View of Engine in position from left side of Car.

an angle to the horizontal, and, therefore, cause the bar to be lowered or raised as it is moved backwards or forwards. The bar presses upon the upper ends of the vertical spindles, B, and slides them slightly, longitudinally, in accordance with the movements of the hand-lever. The effect of the vertical displacements of the rods, B, is to cause the cams to come into contact with the arms with which they engage, either earlier or later, in the cycles of operation of the cylinders, and thus to give the desired result.

The current for the igniters is generated by a rotary magneto, M, which is driven from the inlet cam-shaft by gearing, as seen in Fig. 7. The insulated wire from it is connected with a switch on the steering wheel, and with separate knife-switches, E, above the engine, for each igniter. These knife-switches are mounted upon the fittings of the water-pipe, F, which leads from the top of the cylinder to the top of the honeycomb radiator. They permit either of the igniters to be disconnected, electrically, without any delay; the switch arm is merely wedged down into spring contact pieces which form a portion of the insulated member of the igniter.

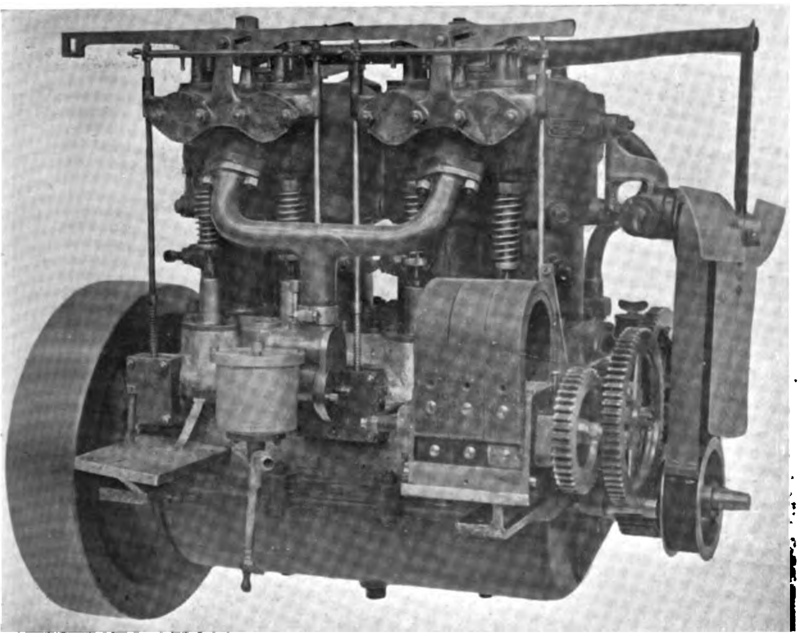


FIG. 6.—View of Engine from Inlet-Valve and Igniter side.

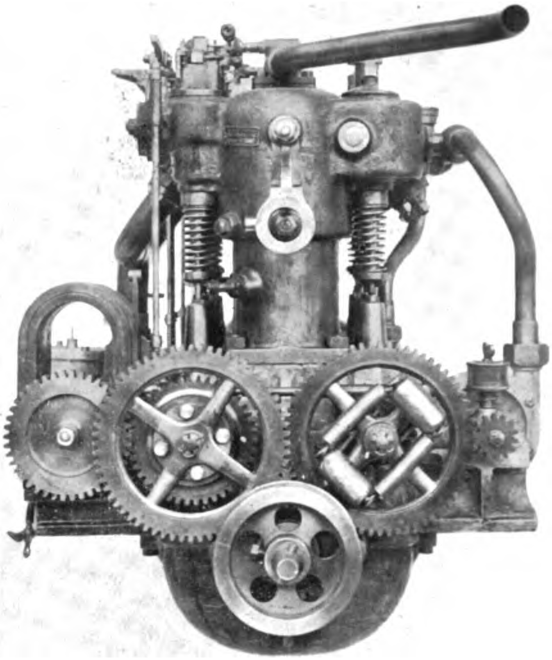


FIG. 7.—View of Engine from the front, showing Magneto and Pump.

The carburettor, L, is of the float-feed type, and is chiefly interesting because it is fitted with two butterfly throttle valves. These valves are connected together, and are so arranged as to maintain an approximately constant degree of richness of mixture at all times; the one valve regulates the passage of the explosive mixture to the cylinder (through the forked induction pipe, K), and the other controls the admission of the auxiliary air to it.

The throttle-valves are connected with a centrifugal governor, formed in the spur-wheel on the forward end of the exhaust cam-shaft, and are also connected with a hand-lever mounted above the steering wheel, the normal speed of the engine being regulated by this "accelerator" lever.

The honeycomb radiator employed is of unusually substantial construction. It forms the front of the bonnet, and is built up of a large number of small round tubes. No additional water-tank is required, as the radiator is found to be capable of cooling the water sufficiently, under all conditions, to prevent any loss by evaporation. The water is drawn from the bottom of the radiator by a large centrifugal pump, which delivers it through the pipe, G (Fig. 5) into that portion of the water-jackets which surround the exhaust valve chambers. The circulating pump is driven by gearing as seen in Fig. 7. Air is drawn through the radiator by a fan, N, connected by a flat belt with a pulley on the front end of the crank-shaft. The tension on the belt is adjustable, the bearing for the fan being, for this purpose, mounted eccentrically in the bracket supporting it.

Separate exhaust pipes, J, are led from each pair of cylinders. They pass to an exceptionally long exhaust-box, which is fixed longitudinally beneath the car on the left hand side. A lubricator of the Dubrulle type, having five sight-feed delivery connections, is fixed behind the dash; its pulley, P, is driven by a belt connecting it with a similar pulley on the rear end of the exhaust cam-shaft. The moving parts of the engine are lubricated on the splash system, and are constantly fed from the lubricator referred to. Provision is also made in the same oiling apparatus by which either lubricating oil or paraffin can be forced by one or other of two small hand-pumps to the pistons. The other sight-feed deliveries from this fitting are used for lubricating the transmission gear.

The change-speed-gear, the controlling levers, and the fittings on the dashboard are shown in Fig. 8. The main clutch is of large size. Its internal member is fixed to the forward end of the first-motion-shaft, this shaft being free to slide longitudinally in its bearings for operating the clutch. The spring which normally holds it in its forward position is seen lying alongside the left member of the main frame in the illustration; it is connected with the rear end of the first-motion-shaft by a system of levers and rods. The end thrust imposed upon the crank-shaft by the spring is taken by a ball bearing fitted between it and the crank chamber. The gear-box, with its cover removed, is shown in Fig. 9, and in Fig. 10 the second-motion-shaft and those portions of the countershaft which are rigid with the shell of the differential gear are shown lying alongside the gear-box, thus exposing the first-motion-shaft and the intermediate "reverse" spur-wheel to view. The second-motion-shaft lies immediately above the first-motion-shaft; the wheels mounted upon it are fixed to it in such a manner that either of them can be easily replaced if necessary. The wheels on the second-motion-shaft are free to slide along it; the three which give the second, fourth, and third speeds, respectively, are secured to one common sleeve, and those which introduce the first and the "reverse" speeds are attached to another sleeve. Our readers will be able to follow the arrangement of the gearing when we mention that the wheels on the second-motion-shaft—taking the front one first—are arranged in the order of 2nd, 4th, 3rd, and 1st; the wheel for the first speed also serves for the "reverse," and is at all times in mesh with the wide intermediate gear-wheel employed, as usual, for giving a backward motion to the car. Each of the sleeves on the first-motion-shaft is connected by means of a fork with its own sliding rod, and the hand lever which operates the gearing is brought into engagement with one or other of these rods, according as to which slot in its quadrant it is in. When it is in its "no gear" position, and is moved sideways from one slot to the other, the downwardly projecting arm connected with it, which engages in the sockets provided on the forward ends of the rods, is at the same time moved over from the one socket to the other. The shape of the hand lever is seen in the illustration; it is bent to that form in order to enable the driver to get in and out of the car easily on the off-side. The slot nearest to him in the quadrant corresponds with the "reverse" speed when the lever is moved backwards, and with the first speed when it is moved forward. The catch, which we have referred to for preventing the "reverse" gear from being introduced unintentionally, is not shown in Fig. 8; it consists of a small pivoted plate which normally covers the slot, but can be removed by the driver with his foot. In the other slot, the lever moves backwards for the second speed, and is pushed forward for the third and fourth speeds, successively. It will be noticed that the brake-lever is fulcrumed about the same centre as the gear-lever, and that the rod connected with it passes right across to the opposite side of the main frame; the rod serves as a bearing for the change-speed-lever and its sleeve to move upon. The rod, at its left end, carries cam-plates, which cause the clutch to be disengaged when the brakes are applied. The brakes on the hubs of the rear wheels, operated by the side lever, are to a certain extent compensated by means of small spiral springs, introduced in the system of levers connecting each of them with the lever.

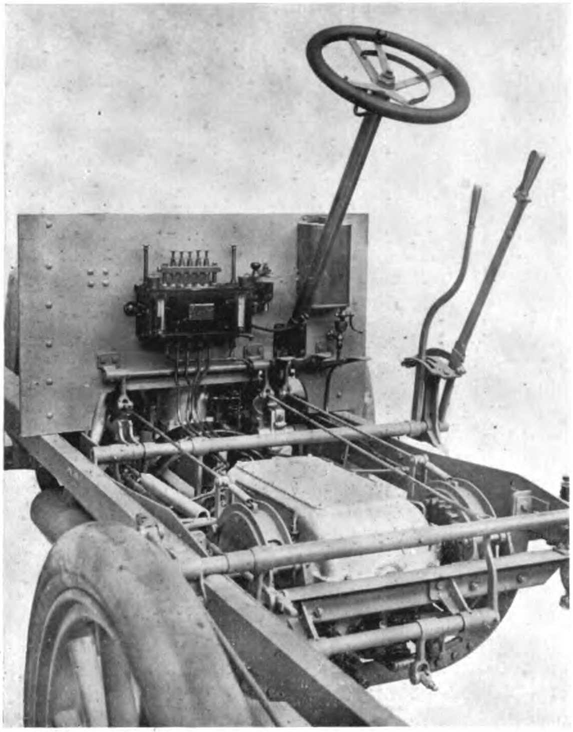


FIG. 8.—Part of the Chassis, showing Gear-box, Controlling Levers and Dashboard Fittings.

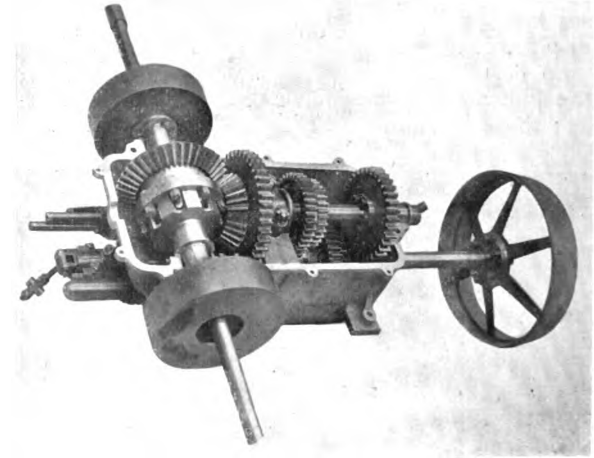


FIG. 9.—The Gear-box with Cover removed.

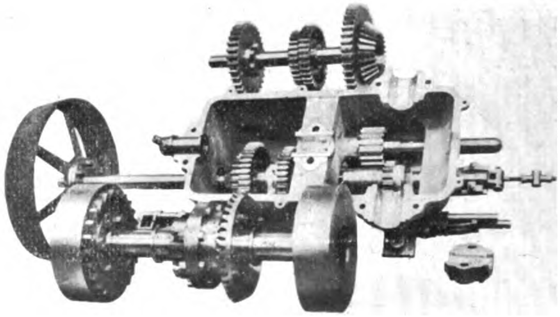


FIG. 10.—The Change-speed-gear with the second-motion-shaft and the Differential-countershaft lifted out and shown separately.

The shell of the differential is not only rigid with the larger bevel wheel, which runs inside the gear-case with it, but is also fixed to two brake-drums which lie outside the casing on the right and on the left. Both the drums are hollow, so that water fed in to cool them is retained by them. The drum on the right is fitted with a ratchet-wheel in such a way that a pawl, fitted to the frame, can be made to engage with it for the purpose of preventing the car from running backwards down hill. The pawl is normally held out of engagement, but can be released by the driver from the seat. The brake-bands have metal friction surfaces and are both double-acting; they are operated by separate foot-pedals, placed in front of the driver. The pedal on the right (and there are three in all), actuates the left-hand brake, but does not disengage the main clutch; the central pedal is connected with the brake on the right and is interconnected with the clutch mechanism; the third foot-pedal is connected direct to the clutch. The water for cooling the brake-drums is contained in a small tank which is seen on the right-hand side of the dash. The tank is provided with a tap by which the driver can allow water to flow into a funnel-mouthed pipe leading from beneath it to the drums.

The two halves of the countershaft pass direct from their bevel-wheels in the differential to the sprockets which drive the rear wheels; no flexible couplings of any kind are introduced into them. The outer ends of these shafts are carried by ball bearings, which lie close up to the hubs of the sprockets; these bearings are fixed by a single nut to the main frame. The differential gear has four planet wheels in it.

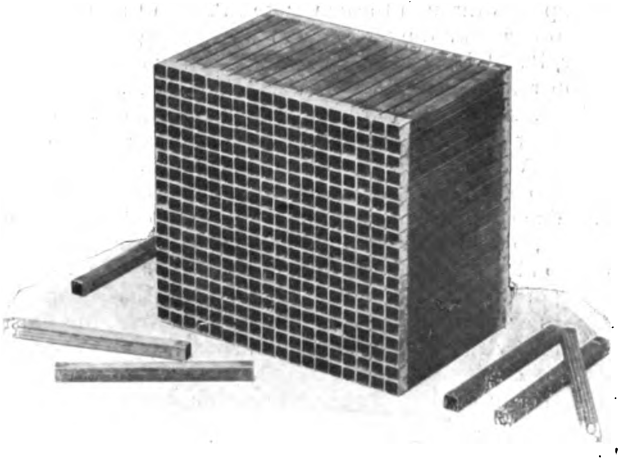
The Dubrulle lubricator with its two small hand-pumps, and the gauges indicating the level of the oil and the paraffin in its two compartments, is seen in place in the centre of the dash. The pipes leading from it to the gear-box and the pipe passing to the engine are also visible in the illustration. The timing lever, already referred to, will also be noticed, fixed to the right of the lubricator. We would also draw attention to the "accelerator" hand-lever mounted above the steering wheel.

The engine and the change-speed gear are entirely closed in, from beneath, by sheet aluminium covers fixed to the frame. These parts of the mechanism are, therefore, rendered practically dust-proof from below. The starting handle is mounted in front, and is normally held out of engagement with the crank-shaft by a spring; it is so fitted that it will remain in either of four positions when not in use—standing vertically upwards or downwards, or lying horizontally to the one side or to the other. The bonnet fits closely up to the dash at its one end and around the radiator at the other; it is made of aluminium, and is provided with fixings by which it can be readily and entirely removed. It is held to the dashboard by two spring bolts, which act as detachable hinges for it, and to the main frame by a fly-nut at each side.

The Rochet-Schneider cars have deservedly established a fine reputation, for they are unquestionably well designed and strongly built. No attempt has been made to reduce their weight abnormally, and every part appears to be very substantial. The actual weight of the chassis is about 15½ cwts. In the recent Touring-Car Competition at Nice, which extended over two days, and was a test of reliability, speed, and hill-climbing power combined, these cars proved themselves to possess exceptional merit. Included in this competition was the tremendous 16 miles' climb of the Col de Braus, with an average incline of something like 1 in 12 or 10—in some parts rising to even 1 in 6. There were in all twelve competing cars, all of which were those of well-known Continental makers. The first and second places were secured by Rochet-Schneider vehicles of the 1903 type, which we have just described, and the same makers' 1902 and 1901 types took the fourth and fifth positions, respectively. The significance of this result is still further increased by the fact that the third position was secured by a Mercedes car. Since then this car has, as recorded by us last week, secured the 100 miles non-stop certificate of the Automobile Club of Great Britain and Ireland, making *en route*, with four people up, the ascent of Dashwood Hill at a high rate of speed.

THE LATEST MERCEDES COOLER.

MECHANICAL and structural improvements connected with automobilism continue to be made, most of them, as usual, being in the direction of simplification. This is notably the case with the new Mercedes 1903 honeycomb cooler, of which we reproduce an illustration. It will be remembered that in the former types of this cooler the water space between the tubes, whether they were round, square, or of any other section, was provided for by wires being wound round the ends of the individual tubes before they were sweated up together. These wire distance pieces have not been altogether satisfactory, for they have at times proved a source of leakage, and their employment has rendered the construction of the whole cooler troublesome and expensive. A most effective constructional alteration has been made in the new type, which is shown in our illustration. The tubes are corrugated except at each end, and thus provide a greater cooling surface. They are square shouldered at their ends (as seen in the separate tubes shown in the illustration), the shoulders being of sufficient size to allow the necessary space for the water between the tubes when they are assembled in position. As will be quite obvious, the assemblage of a number of tubes thus constructed into a complete honeycomb cooler, and soldering up of the ends, is enormously facilitated by this improvement, and the chance of leakage practically eliminated. Owing to the corrugation of the tubes the cooling surface provided by the new radiator is enormous, and one, containing 7 litres, or a little over 1½ gallons, of water has been found sufficient for a 60-h.p. motor. This may indeed be regarded as a technical triumph.



THE EISEMANN AND BOSCH SYSTEMS OF ELECTRIC IGNITION.

THE accompanying drawings will enable the general arrangement and principles both of the Eisemann and the new Bosch systems of electric ignition to which we referred in our issue of April 25th, and in connection with the Exhibition at the Agricultural Hall, to be understood in detail.

Fig. 1 illustrates diagrammatically the Eisemann ignition, Figs. 2 and 3 similarly showing the new Bosch ignition as arranged for 4 and 1 cylinders, respectively.

As our readers are already aware, the Eisemann ignition is practically a coil ignition in which the battery is replaced by a magneto generator. Referring to Fig. 1, which shows the Eisemann ignition arranged for 4 cylinders, M is the field magnet of the magneto, the armature of which, M^1, is mounted on a shaft connected by the spur wheels, W and W^1, with a separate shaft parallel to it, and driven at half-speed—the same speed as that of the cam-shaft of the engine—and carrying on its far end the high-tension commutator, D. The spur wheel, W, is not rigid with the armature shaft, but is integral with a sleeve carrying the pulley, T^1, the sleeve driving the armature shaft by means of a pin, T^2, a fork, T, connected with a bell crank lever controlling the movements of the sleeve. This part of the apparatus, as will be described later, is for controlling the moment of ignition. The ends of the armature winding are connected to the two connecting rings, M^2 and M^3, with which the spring connecting brushes, P^1 and P^2, make contact. The current passes through the conductor, P, from the brush, P^1, to the primary winding of the coil, and through the contact breaker, P^3, P^4, back to the brush, P^2. The contact breaker, P^4, is operated by the double cam, M^4, which, as the spur wheel, W, is designed to run at twice the speed of W^1, breaks contact four times for every revolution of the cam-shaft of the engine. A condenser, C, is arranged across the contact breaker so as to increase the secondary spark in the usual way. The condenser is shown connected to P^3 and P^4 by thin lines, but in practice it is of importance that the wire to the condenser should be at least as thick as the primary winding of the induction coil. One end of the secondary coil, S, is earthed and the other is connected to S^1, the brush of the revolving high tension commutator or distributor, P. It will, of course, be understood that the current furnished by the armature, M^1, is an alternating one, but the cam, M^4, is so arranged that the circuit is only broken when the current furnished by the armature is at its maximum in either direction. The high-tension commutator or distributor, D, receives current through the brush, S^1, which runs on a metal ring forming the periphery of the wheel. This is in conducting connection with the segment, D^1, which makes consecutive contact with each of the brushes, D^2, leading to the sparking plugs, F^1, F^2, F^3, F^4.

The moment of sparking is determined by the breaking of the contact, P^3, P^4, the contact to any one of the brushes, D^2, having been made by the segment, D^1, slightly before that instant arrived, the connection being also maintained slightly after the spark has passed. This enables the spark to be advanced or retarded within the necessary limits by simply advancing or retarding the moment at which the contact breaker, P^4, is raised. The timing is effected by the fork, T, engaging with the guide pulley, T^1; moving this to the right or left rocks the shaft carrying the cam, M^4, and the armature, relatively to the spur wheel, W, and by moving T^1 to the right or left the moment of ignition may be varied as required.

The Eisemann ignition, it will be observed, has two very marked good points: it enables the battery, which is so often a source of trouble, to be dispensed with, and is as independent and reliable, therefore, as an ordinary low-tension magneto; and it gets rid of all the difficulties connected with the make and break contacts mechanically operated inside the cylinder. There is, therefore, no difficulty in accurately synchronising the spark in all four cylinders, so that it may be said to comprise both the advantages of induction coil and ordinary magneto systems.

The new Bosch ignition is illustrated as applied to four cylinders in Fig. 2, in which the permanent field-magnet is shown upside down, for the purpose of enabling the different parts and connections to be better seen. The armature, A, which is stationary, is provided with two windings, A^1 and A^2, of which A^1 is of stout wire, and corresponds to the primary winding of an induction coil, A^2, being of fine wire and corresponding to the secondary. For the sake of convenience it is shown nearly at right angles to its real position. One end of the winding, A^1, is earthed on to the shaft of the apparatus, and the secondary winding forms a continuation of the primary. The other end of the primary winding, A^1, is led to one side of the contact breaker, B^3, and to one terminal of the condenser, the other terminal of the condenser and the moving arm of the contact-breaker, B^3, being earthed.

As in the low-tension forms of Bosch magneto, the changes of magnetism in the armature core which give rise to the current are produced by the rotation of a soft iron sleeve, B, which partially surrounds it, and is integral with the hollow shaft, B^1, which also carries the notched disc, B^2, and the high-tension distributing disc, D. The action of the sleeve, B, is exactly the same as in the case of the low-tension magneto, but as some readers may not be familiar with it, it may be as well to recall it. If the sleeve, B, entirely encircled the armature, it would shield it completely from the action of the field magnet. It is, however, slotted, and when the slots come opposite the poles of the field magnet, the armature receives magnetism from the field magnet, and is deprived of it again as the slots pass round with great rapidity, and a powerful current is consequently induced in its windings. The contacts of the contact-breaker, B^3, are normally held together by the action of the disc, B^2, and during these periods the low-tension winding, A^1, is closed on itself, so that a powerful current flows through it at the moments when the magnetism of its core is being varied by the rotating sleeve, B. When one of the notches in B^2, which are steep on one side and bevelled on the other, come under the lower end of the contact lever arm, B^3, the latter snaps back, owing to the action of its spring, separates the two contacts, and breaks the circuit of A^1. This produces a high-tension current in the secondary, or fine wire winding, A^2, just as in an ordinary induction coil, the condenser, C, increasing the effect in the well-known way. The secondary winding, being connected to the primary as already described, and as it is earthed through it, successively connecting the central rods of the sparking plugs, F^1, F^2, F^3, F^4, to the opposite end of the secondary, A^2, causes sparks to pass in the four cylinders at the right moments, the tension or voltage of the primary and secondary being added to one another. The distribution is effected by the commutator, or distributor, D. This consists of the rotating disc, D, carrying

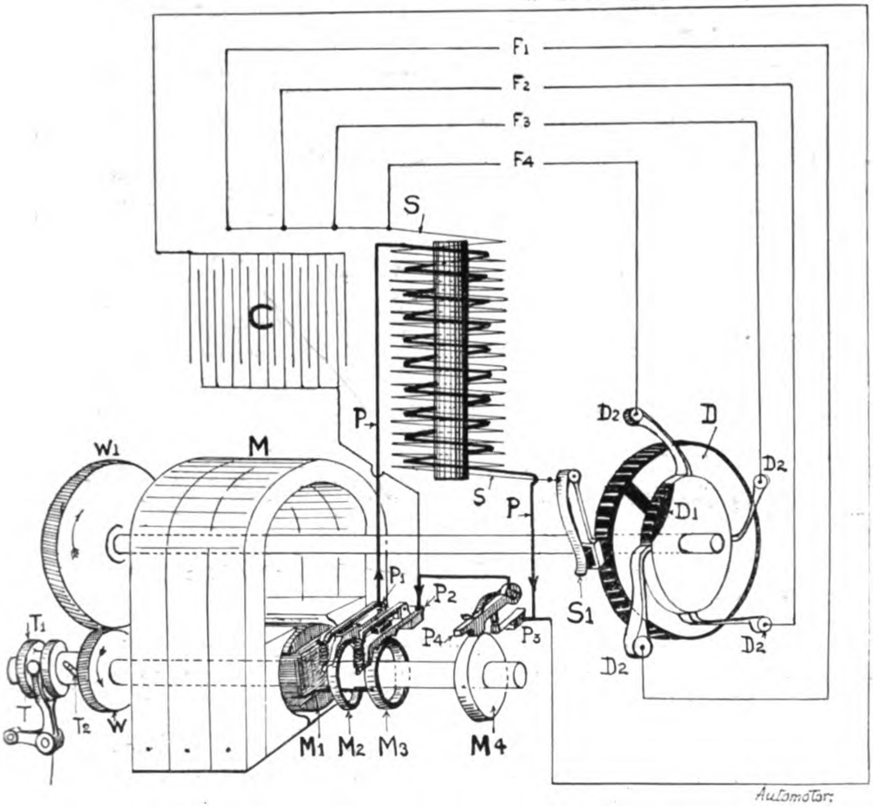


Fig 1.—Diagram showing the Eisemann Magneto High-Tension Ignition System.

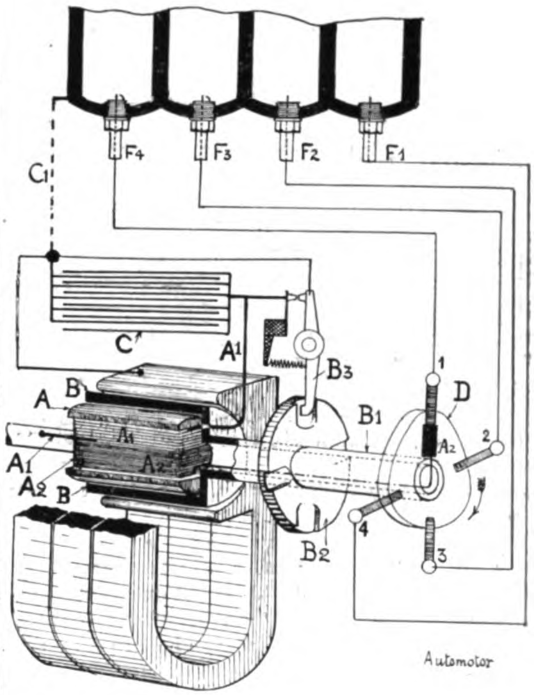


Fig. 2.—Diagram showing the Bosch Magneto High-Tension Ignition System.

the metal plate, A^3, which is in conducting connection with the insulated end of the secondary winding, A^2. As the disc revolves this metal plate makes contact successively with the fixed brushes, 1, 2, 3, 4, which it does in each case just before the notches in B^2 cause B^3 to break the primary circuit, A^1. Sparks take place successively at the right moments accordingly in the four cylinders. The new Bosch ignition may claim practically the same advantages as the Eisemann, and is more compact, not having a separate induction-coil. The main relative advantage possessed by the latter apparatus, as shown, would appear to be the possibility of advancing or retarding the moment of sparking in the manner described. That, however, could be easily applied to the Bosch system by making the hollow shaft, B^1, displaceable relatively to the engine shaft in practically the same way.

Fig. 3 shows the new Bosch arrangement as applied to a single cylinder. All the parts are similarly arranged, except that the high-tension distributor is, of course, superfluous, and is omitted.

It has been claimed for the new Bosch ignition that it acts in very much the same way as a high-tension spark in combination with the electric arc, the high-tension spark being used to start the arc, which then follows across the path which the high-tension spark has opened up for it, with, of course, a vastly greater volume and heating power than that possessed by the spark which started it. It is hardly possible, however, that this can be the case, for the relatively great "thickness," that is to say, in reality amperage of low-tension sparks, as compared with high tension, is due to the small self-induction in the circuits which produce them. In this case, however, the self-induction of the secondary is added to that of the primary, and the amperage or volume of the spark cannot be seriously greater than that which the high tension winding would of itself allow to pass.

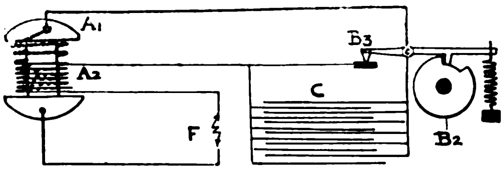
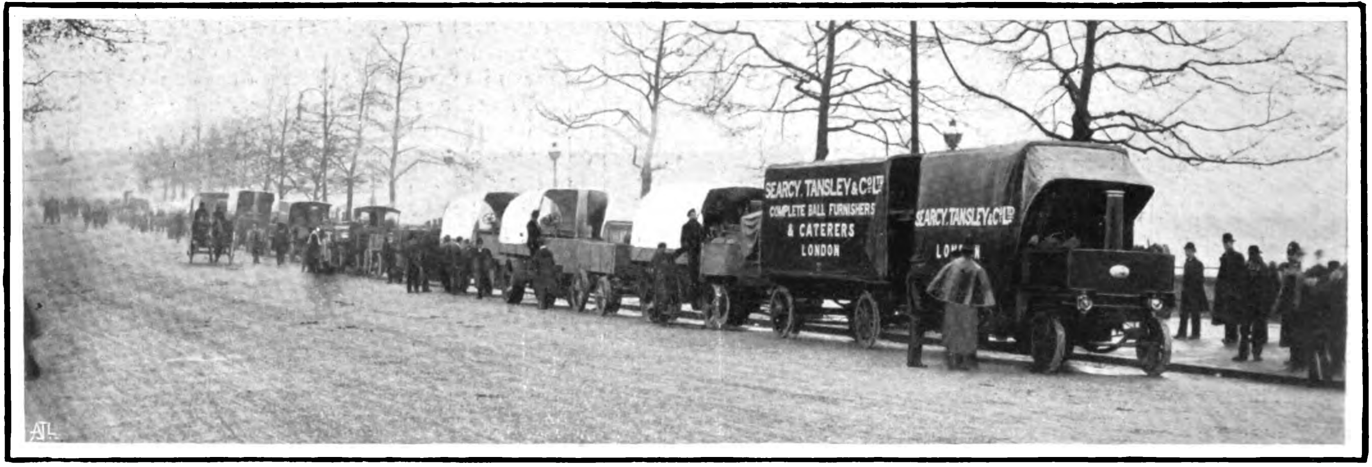


Fig. 3.—The Bosch High-Tension System for a Single-Cylinder Motor.

* * *

Last week a serious fire occurred at the Daimler Motor Company, Limited's, premises at Coventry. The fire broke out about 3 o'clock on Thursday morning, and burnt itself out so rapidly that it was impossible to save the painting and upholstery shed from being entirely destroyed. Fortunately no other portion of the premises was injured, and the ordinary routine of the works will not in any way be interfered with. Of course, customers whose cars were actually in the destroyed building will have to wait some little time before deliveries can now be filled, but a re-allotment of chassis, &c., has already been made, and the delay is not likely to be of any serious moment.

MAY DAY MOTOR PARADE.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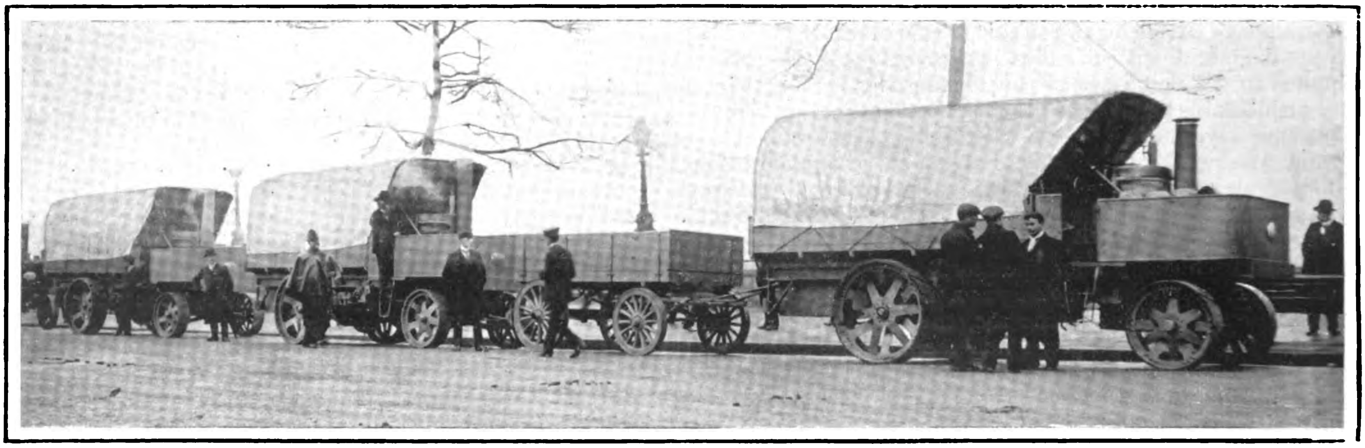
May Day Motor Parade.—The line of vehicles before the judging, seen from the Westminster Bridge end of the Thames Embankment.

THE May Day Motor Parade arranged by the Thornycroft Steam Wagon Company, which we announced last week, took place on the Thames Embankment between Westminster and Waterloo Bridges, from eight to nine a.m. on May 1st. The weather was not propitious, but fortunately until after nine o'clock the rain did not thoroughly assert itself, and this circumstance enabled the Judges and the onlookers to witness the parade in comparative comfort. As a result of the success which last Friday's function proved to be, it has been determined to make the parade an annual fixture, under the auspices of the Automobile Club, when general prizes will be offered, open to all makes of heavy vehicles. The idea is an extremely happy one, especially at the present early stage of the industry, as the interest which it should induce in the machinery and appearance of the vehicles by their drivers should lead to prolonging the life of the machines. Upon this occasion the prizes offered were, it was understood, to be allotted only to vehicles built by the organisers of the parade, and, therefore, it was hardly expected that many other makers, under the circumstances, would participate in the Show. In addition, however, to the 25 Thornycroft vans which got into line, there were five by the Lancashire Steam Motor Company, of Leyland, and one by the Straker Steam Vehicle Company. No decorations were attempted, as the points to be considered were cleanliness of boiler and mountings, of gear, state of lubrication of gear, and for the general cleanliness of the wagons, consideration being given in allotting the awards to the period for which the vehicles had been in use. The Judges were the Hon. John Scott Montagu, M.P., and Mr. W. J. Bull, M.P. The Judges, who were driven up and down the line on a Thornycroft petrol car, after very careful examination, awarded the prizes as follows:—First, to a Whiteley furniture van, manufactured by the Thornycroft Company, driven by A. Shewry; second, a van and trailer belonging to Searcy, Tansley, and Co., built by Thornycrofts, driven by W. Hubbel; and, third, a lurry belonging to Dewar's Whisky Company, driven by G. Parkinson.



May Day Motor Parade.—The three Thornycroft wagons built for the Belgian Government for use in the Congo Free State.

May Day Motor Parade.—On the Embankment. After the Judging. The three winning vehicles, in order of merit, heading the line in front of the Savoy Hotel.

The remarkable manner in which mechanical traction is finding favour in totally different phases of commerce was exemplified by the vehicles which paraded on the Embankment. Amongst those firms whose vehicles put in an appearance were Messrs. Watney, Coombe, and Co. (two lurries with trailers, each carrying about 1,000 gallons of ale); Fuller, Smith and Turner; Schultze Gunpowder Company; T. and W. Farmiloe; Ilford, Limited; Wallington and Co. (bricks and sand), the Corporation of London, the Borough of Hampstead, the Middlesex Hospital Laundry, J. Mowlem and Co. (stone), and Harmsworth Brothers. Three Lancashire Leyland lurries belonging to Mann, Crossman and Paulin were present, and two of the same make built for the Borough of Chelsea, fitted with slop-van bodies. In addition to the other Thornycrofts, three of the latest make of this firm in workshop grey bodies and canvas covers made an effective display. They have been built for the Belgian Government for use in the Congo Free State, and are fitted with 45-h.p. engines, one of the lurries having a trailer attached. These will be seen in one of our photographs. The back-wheel tyres are 14 in. wide and the front 10 in. wide, and are built specially for the work they are likely to encounter. An old relic in the shape of the Chelsea Vestry water-tank vehicle (No. 8), built by the Thornycroft Company, was in strong contrast to the later built vehicles, and showed the great advance which has been made since this was originally designed in 1897. It was not acquired by the Chelsea Vestry until 1900, when they purchased it second-hand, and although it has been in constant use ever since it left the works, and is fitted with the old chain drive, the driver reported it as working as well as on the day on which it was first put into use. It certainly was a model of cleanliness, and the disappointment of the driver at not receiving one of the awards induced the Judges to allot him a special extra prize of £1.

OF course the motor car comes in everywhere. It has now appeared, like Daniel, in the lion's den—at the Hippodrome. Herr Julius Seeth brought in a motor car the other day, and induced four of his lions to take a seat in it, when they were photographed. It is said that the lions at first rather disliked the smell of the petrol, but were induced to take their places by chunks of beefsteak. It occasionally happens that automobilists, particularly after a long run, are induced to leave their places by a precisely similar cause. We do not know with what tyres the motor car in question was provided, but it is evident that Herr Seeth's lions were in the pay of a tyre company, for while some of them were being induced to leave the car to return to their cages, the others commenced such searching examination of the tyres with their claws that they penetrated to the inner tubes and reduced the tyres to ribbons.

THE Austrian Government and municipal authorities on the one side, and the Austrian railways on the other, are hardly in accord in their methods of encouraging automobilism in the Austrian empire. Whilst the former are in every way encouraging manufacturers to make further progress in building automobiles by putting into use a considerable number of municipal motor vans and military waggons, thereby giving practical proof of their good intentions, the railway authorities refuse to carry petrol driven motor vehicles on express or passenger trains except under a freight charge equivalent to an ordinary 5-ton load. This applies also to motor cycles. It is deemed necessary to employ a special waggon for their transport whether the fuel tanks contain any petrol or not. Needless to say, this extremely unfair regulation is leading to considerable agitation, as at present the railway authorities are not disposed to give way in any shape or form.

JOHNSON TESTIMONIAL FUND.

The formal announcement was made at the Annual General Meeting of the Automobile Club of the resignation of Mr. Claude Johnson, who has shown such remarkable energy and ability in his secretarial position in conducting the affairs of the Automobile Club almost from its inception. The further announcement by the Chairman that a testimonial would be organised and presented to Mr. Johnson has now taken definite shape. Although Mr. Johnson's resignation has practically taken effect, the Club will have the benefit of a portion of his time each day until June. A preliminary letter has been circulated to prominent members of the Club, with the result that a first announcement of subscriptions is now made, amounting to £347 14*s*. This is merely a list by way of starting the general testimonial fund, and we feel sure that the whole of our readers, whether they be members of the Automobile Club or not, will unite in ensuring that adequate recognition may be given to Mr. Johnson of the untiring efforts which he has made in the interests of the automobile movement generally—efforts which were far beyond any work which could possibly be looked for from any ordinary worker in Mr. Johnson's position. His unvarying courtesy to all those with whom he came into contact was proverbial, and there is no doubt that it is due mainly to his foresight and energy that it has been found possible to run the race for the Gordon-Bennett Cup in the British Isles. Those of our readers who wish to contribute to what should be a universal testimonial—that is, one embracing the name of every active automobilist in the country—should send their cheques without delay to the Chairman of the Automobile Club, at 119, Piccadilly.

The Club Committee head the fund with a donation of 100 guineas, and the following is a complete list of the amounts received up to the time of going to press :—

Club Committee, A.C.G.B.I., £105; Mr. Alfred Harmsworth, £52 10s.; Mr. Paris E. Singer, £26 5*s*.

£10 10*s*. each, Messrs. Roger W. Wallace, C. Arthur Pearson, J. M. Gorham, Stanley Spooner, Hon. C. S. Rolls, Lionel de Rothschild.

£5 5*s*. each, Messrs. Basil Joy, T. B. Browne, J. D. Siddeley, E. Macrory, E. K. Purchase, W. J. Leonard, Harry Footner, Sir David Salomons, Bart., Sir J. I. Thornycroft.

£5 each, Messrs. Henry Bubb, W. G. D. Goff, and Col. R. E. Crompton.

Sir J. H. A. Macdonald, £3.

£3 3*s*. each, Dr. Boverton Redwood, Messrs. G. Foster Pedley, Lyons Sampson, A. F. Yarrow, Radford Cooke.

£2 2s. each, Messrs. Robert Todd, R. E. Phillips, E. M. C. Instone, Sir Edgar Vincent, Mr. W. Worby Beaumont, Captain Kenneth, R. Campbell.

£1 1*s*. each, Major F. Lindsay Lloyd, Messrs. Henry Sturmey, W. M. Letts, G. C. Ashton Jonson, Geo. Montagu, M.P., Prof. Hele-Shaw.

10*s*. 6*d*. each, Messrs. H. B. Horton, H. F. Chamen.

Total, £347 14*s*.

A well-known Irish automobilist had a rather amusing experience in Dublin. He side-slipped into a horse and cart and brought the horse down. The horse was not injured, and he compensated the driver and received a receipt from him. The driver's wife, however, it appeared had been looking out of a window near by, and the automobilist was subsequently rather entertained to receive a letter from a solicitor on her behalf demanding compensation for the nervous shock which she had experienced.

THE LONDON GENERAL OMNIBUS COMPANY'S "FISCHER" OMNIBUS.

The first petrol-electric omnibus built specially for use in London, and to replace the ordinary horse-drawn 'buses which are such a familiar sight in our streets, arrived recently from America. It is about to undergo a thirty-day trial in actual practice in the service of the London General Omnibus Company. We understand that the route will probably be from the Angel, Islington, to Walham Green. We believe that two or three more of these vehicles will be in this country shortly, and that at least one of them will be used by the London Road Car Company.

This vehicle is constructed on practically the same lines as the other Fischer vehicles, which have already been fully described by us. The first of these to make its appearance was the small 'bus, of which we gave details and illustrations in our issue of June 14th, 1902 (Vol. VII., p. 218). Subsequently a 1-ton delivery van (see page 303 in the current volume) and a 5-ton truck (Vol. VII., p. 518) arrived, both of which are doing useful work in the London neighbourhood.

The new 'bus, which is constructed to carry thirty passengers, closely resembles the latest of the ordinary horse-drawn vehicles. As will be seen from our frontispiece, it has garden seats on top, to which access is obtained by the usual stair-way from the platform at the back. The space occupied by the engine and dynamo gives it a somewhat heavy appearance in front, and the driver's seat is placed somewhat high up. The vehicle, without its accumulators, fuel or water, weighs under three tons, and the machine is capable of running at a speed of 12 miles an hour.

The engine is of the 4-cylinder vertical type, and develops about 16-h.p. at a speed of 475 revolutions per minute. The dynamo, to which it is coupled direct, has an output of 9 kilowatts, and is wound for a normal E.M.F. of 125 volts. Each of the rear wheels is driven, through closed-in gearing, by a separate motor which is suspended in front of the back axle. The battery consists of 48 Chloride cells; they are placed beneath the seats inside the body. They have a capacity of 125 ampère hours at a three-hour rate of discharge. The wheels are shod with solid rubber Hartford tyres, and the same method of suspension is adopted as hitherto, semi-elliptic side-springs being employed at the back, and similar springs, whose rear ends are connected together by a transverse spring, being fitted in the front. The electrical connections are identical with those we have given in detail previously, and they permit of the vehicle being run without the engine, and of the engine being started from the cells. A somewhat larger radiator than before is placed beneath the front part of the car; it consists of finned tubes. Band-brakes are provided on each of the armature shafts of the motors, and spoon-brakes on the tyres of the rear wheels, the ordinary electric brakes being also available.

The Fischer Motor-Vehicle Promotion Syndicate gave a trial of the new machine on Wednesday last, to which a large gathering of Press representatives and others were invited. The route taken was to Richmond Park, *via* Isleworth and Brentford. The ascent to the Star and Garter Hotel was made without difficulty. The return trip back to town, through Mortlake and Barnes, was also accomplished at a fair rate of speed without any hitch.

PATENTS FROM THE MANUFACTURERS' POINT OF VIEW.

(*Continued from page* 431.)

WHEN we deal with the aspect of affairs from the defendant's point of view, matters are to a large extent different. His great object is naturally to upset the patent, to show that the same invention has been previously disclosed to the public, either in published specifications or in technical publications. Preparing the case from a defendant's point of view, therefore, involves, as a rule, an enormous amount of work in the Patent Office Library, sometimes in the library of the British Museum, and in any other library where technical information bearing on the subject is accessible. It must be, of course, accessible to the public, and it must be contained in some publication written in one of the generally known European languages. French and German are regarded as such in this country, but a description of an invention in Russian, though existing in this country prior to the date of the patent, would not be held to constitute an anticipation. Intermediate languages such as Dutch or Italian would be rather doubtful; it would probably depend, in the opinion of the Court, upon the probability of people interested in that class of invention being acquainted with these languages. A search, however, in French, German and English is absolutely essential. And let it be borne in mind that however able a barrister may be, he very seldom can conduct the defence of a case to a successful termination unless he is provided with materials by the searchers. This is one of the matters which ought to be carefully attended to by the expert who is in charge of getting up the case. The usual conventional lines adopted are to entrust the whole matter to a patent agent and instruct him to make a search. Patent agents in the first rank generally employ their own search clerks for ordinary work, but when extra business of this kind comes in they usually have recourse to independent search clerks, who earn most of their living in the Patent Office library and work for anybody who is willing to employ them. These men are not by any means always possessed of high technical attainments, and as a rule they charge the patent agent about one-third of what he charges the client. It would probably in all cases, therefore, be better if the defendants in an action were to organise a search in addition to the one entrusted to the patent agent, or instead of it, engaging their own search clerks and having their labours supervised by the expert in charge of the case.

The importance of independent searching was very well demonstrated in a recent patent action, in which an invention of the greatest importance to the automobile industry came into Court. This patent was mainly upset by a certain anticipation which was discovered by an independent expert, but was not found out by the patent agent who was engaged to make the regular search on behalf of the defendant. The defence was, no doubt, brilliantly conducted, but it is very likely that it would not in this case have been successful but for the discovery of this patent. No more convincing evidence can be afforded than that supplied by this case of the importance of preliminary work in matters of this kind, and the great value of having at least two searches conducted on independent lines.

The preceding observations depend upon the assumption that if the patent be valid in the case in question, actual infringement can be easily proved.

Infringement from this point of view has two aspects; it is a matter partially of interpretation of the patent and partially of matter of fact. Assuming certain facts, the question of whether an infringement has taken place or not, depends upon the interpretation given to the patentee's claims. In order to support the validity of his patent he often finds himself, or his barristers find for him, that it is necessary to give a narrow interpretation to his claims. This may save the patent and very often does, but it lets the infringer equally frequently escape.

If there is any doubt about the alternative it is perhaps the wiser course to adopt, for it keeps the patent, though it lets one offender off. When we come to deal with the question of facts without reference to the interpretation of the patent, we encounter a wide number of considerations. Certain facts must always be alleged to establish a *prima facie* case. Of course in the vast majority of instances the facts are easily ascertainable, but there are a variety of instances in which processes are carried on inside factories with closed doors where it is by no means easy to ascertain whether infringement is taking place or not. In such cases the patentee will generally find himself in the unpleasant position of having to employ a detective. There are detectives who make a special business of this class of work and insinuate themselves into factories in the guise of workmen or otherwise to ascertain what is being done. It is sometimes possible to dispense with their services, but if there is anything even remotely approaching a *prima facie* assumption that infringement is likely, a patentee, on filing the necessary affidavits, will be able to obtain an inspection order from the Court. In cases where the erection of considerable plant is involved, this method of procedure may work all right; but where it is a question merely of processes, which constitute improvements which could be omitted without interfering with the general work of the factory, it is better to have recourse to the detective. The reason of this is, that the moment the patentee moves for an inspection order, the infringer would be aware of the fact, and could easily suspend employment of the process till the inspection had taken place, and the danger had blown over. Of course, in addition to the employment of detectives, a good deal may be effected through the evidence of discharged workmen in such cases, but it is not always that they have sufficient knowledge of the processes to be able to give intelligible evidence, and their evidence is also liable to be accepted with some reserve by the Court. On the whole, therefore, it is perhaps better to rely upon the services of a detective in order to establish a *prima facie* case.

When all the evidence has been collected and consultations held, when, in fact, the preliminary work entrusted to the expert who is getting up the case may be regarded as complete, there is still a great deal to be done on either side before the case actually arrives at a hearing in open Court.

(*To be continued.*)

* * *

A SYSTEM of purchasing cars on the instalment plan has been instituted by Messrs. C. S. Rolls and Co., of Lillie Hall, Earl's Court. The terms offered are 25 per cent. down on ordering and the balance payable by four quarterly instalments after the delivery of the car, 5 per cent. being added to the purchasing price for the time concession made.

THE GORDON-BENNETT RACE AND IRISH FORTNIGHT.

As already announced, for the American team, Mr. Alexander Winton will drive one of his own racers, and the other Winton car will be driven by Mr. Percy Owen, the Peerless Racer being in the hands of Mr. Mooers.

Mr. Percy Owen's Winton car has a 4-cylinder horizontal engine, which follows Winton lines in general respects, and develops about 40 h.p. The cylinders lie transversely, and are water-jacketted. The gear-box is very compact. Two forward speeds and a reverse are available, and a direct through drive is obtained on the top gear to the bevel wheels which drive the back axle. The main frame is of armoured wood. The wheel base is 8 ft. 4 in., and the wheels are fitted with 32 in. by 4 in. Goodrich-Clincher tyres. The total weight of the car is under 1,900 lbs., and the seats are placed above the rear axle.

The large Peerless Gordon-Bennett car, of which we show a photograph, weighs about 2,200 lbs., and has an 80 h.-p. engine. The wheel base is about 9 ft., and the wheels are 34 in. in diameter, the rear wheels having 4½-in. tyres, and the front ones 4-in. The engine is of the 4-cylinder vertical type, with a bore of 6 in., and a stroke of 6 in. The cylinders themselves are constructed of steel tubing, screwed into cast jacketed-heads, and the inlet-valves, which are mechanically operated, are arranged on the opposite side of the cylinders to the exhaust valves. Two ignition systems are employed, the one being the ordinary high-tension, and the other a magneto low-tension; both are arranged so that they can be timed by the driver. The high-tension plugs are fixed immediately above the inlet-valves, and the low-tension igniters pass through the walls of the inlet valve chambers. The change-speed gear provides four forward speeds and a reverse, and is of the sliding spur-wheel type. A direct-through-drive is obtained on the top speed to a longitudinal shaft, which drives the live-rear-axle in the usual way. Ball bearings are used throughout. The main frame is constructed out of $\frac{3}{16}$-in. sheet steel, formed in precisely the same way as a pressed steel frame, although no dies were available at the time for stamping it in the ordinary manner. The petrol tank is beneath the driver's seat, and the mechanism is so arranged that the front wheels carry about 400 lbs. more weight than the rear wheels.

The smaller Peerless car, which has been completed some months, is fitted with a 40-h.p. motor. The four cylinders are bored out to 4⅝ in., and the stroke of the pistons is 5½ in. The main frame of this vehicle is constructed of channel steel. The wheel base is 8 ft. 4 in., and the wheels are fitted with tyres 34 in. in diameter by 3½ in. The total is about 1,850 lbs.

The Harkness car, which was specially built for the race, and which so far has not received any pet sobriquet, is fitted with a canoe-shaped body which is very similar to the designs of Serpollet. The main frame is constructed of stamped steel, and the entire machine is built very low. The wheel base is 8 ft. 6 in., and the wheels are 36 in. in diameter; 4½-in. tyres are fitted to the rear wheels and 3¾-in. tyres in front. The seats are placed near the rear axle.

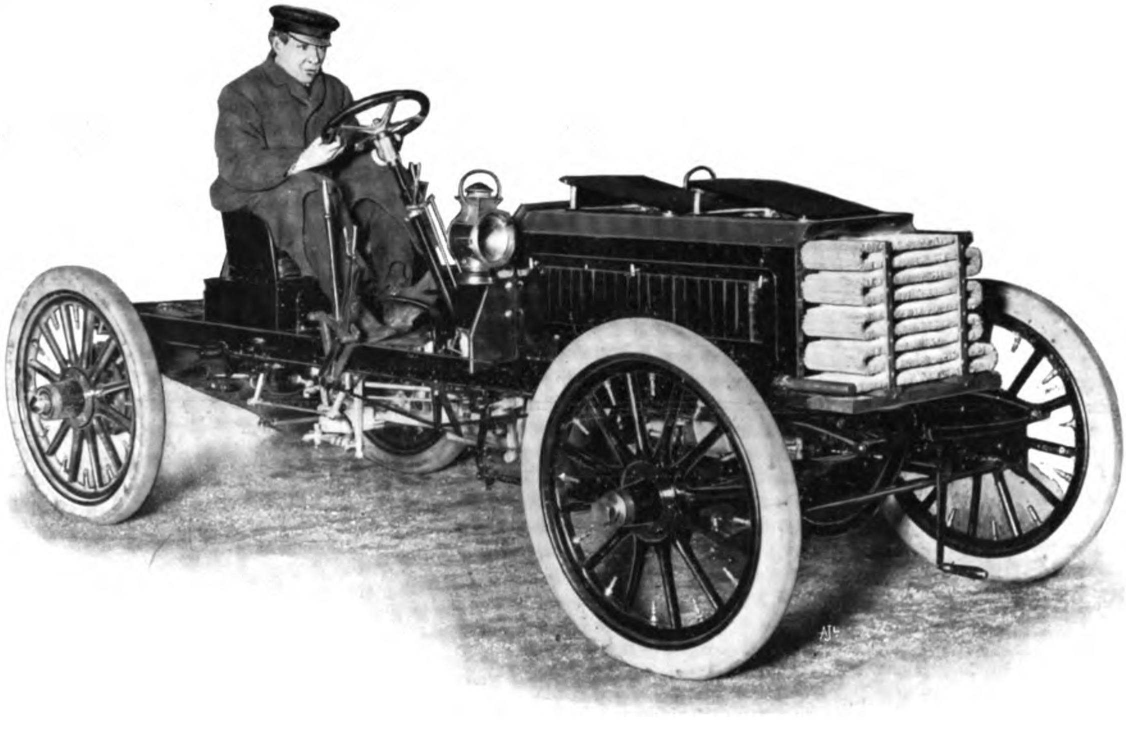
MUCH sore feeling appears to have arisen in the United States by reason of the secrecy observed by the Automobile Club of America in connection with the eliminating trials for the Gordon-Bennett Race. It appears to be directed in several quarters against Mr. Albert R. Shattuck, the President of the Club, upon whom it is sought to place the responsibility of the entire proceedings. Why such feeling should be exhibited we hardly understand, as, judging by reports of persecution generally by the police in the States, and the aggressive attitude of the American motophobist, it was an absolute necessity not to divulge the time and place of the trials. Possibly we feel these matters less acutely in Great Britain, but we are pleased to think that our methods of reproof and disapproval in the British Press do not take the form of which the following, from a Transatlantic contemporary, is a sample:—

> Thanks to the bumptious egoism of that inordinately superior person, Albert R. Shattuck, the American automobile has been made the laughing stock of two continents, the American automobilist has been degraded to the level of a cheap prize fighter, and the sport of automobilism in America has been put on a par with the trickery of the thimble-rigger and the confidence man—all within the past week.
>
> Months ago we called attention to the suicidal policy of re-electing this person to the presidency of the Automobile Club of America. We did so deliberately, yet at the same time tried to let him down as gently as possible. We feared that his self-importance would land the club in difficulties, a matter of small importance so far as the club, as a private organisation, was concerned, but most vital in view of the fact that the organisation was known to the world as the leading automobile club of America. . . . .
>
> No sympathy need be wasted upon the Automobile Club of America for preferring King Jackass to King Log or King Stork. They have taken their punishment in their own hands. But should the result of the race itself mean the transfer of the Gordon-Bennett trophy to America, Shattuck's presidency would become a national calamity.

MINDFUL of the interests of their members, the Midland Automobile Club have made special arrangements in connection with the Gordon-Bennett race for visiting Ireland during the Irish fortnight. It is proposed that it should be a motor tour throughout, starting on June 27th or 28th, and driving to Holyhead or Bristol, and there shipping across for Dublin. The headquarters of the tour, at the Golfers' Hotel, Sutton, County Dublin, will be reached on June 29th, when it is proposed to run over a portion of the course and the surrounding district on the following day. After the Cup race and other main events, a return will be made on July 4th to Bristol or Holyhead. The inclusive terms will be for the entire period 4 guineas per head, but of course each individual must independently provide his own car or obtain a seat in a car. To enable all the details of the tour to be satisfactorily arranged, those proposing to join should notify their intention to the Hon. Secretary, Mr. T. C. Aveling, not later than the 9th instant. If possible, a separate club enclosure will be arranged from which to watch the race.

WE have on other occasions referred to some of the peculiarities of Irish country road traffic, particularly difficulties owing to the manner in which the Irish peasantry, from time immemorial, have made use of the high-roads as public pasturage. Apart from this, however, there are two dangers which cannot too often be drawn to the attention of automobilists visiting the island. In addition to the donkeys, ponies, and cattle on the roads, and the numerous dogs with which every village is unnecessarily provided, there are the pigs. Every cabin has a pig, and sometimes a good many of them, and pigs are perhaps the most awkward customers to meet on the road that can be imagined. They very frequently reside in the interior of the cabin itself, and owing to domestic differences, suddenly issue from the door, and make a bee-line across the road at a high rate of speed. It is well, therefore, whenever approaching a cabin, to have the car well in hand. Another danger is what we, perhaps, might term the rear shafts of many agricultural carts. These are long wooden projections sticking out behind, and nearly as long as the regulation shafts in front. They are used for propping the cart when at rest. From behind they are not readily visible, being, of course, foreshortened, but as the countrymen on the approach of a car very often turn their horses' heads towards the ditch, the cart swings round, and then the rear projections either take up the whole of the road or point at the approaching bonnet of the car in a manner threatening to smash it to pieces.

OUR Irish contemporary, the *Motor News*, publishes a useful map of the Gordon-Bennett course in which the relative value of the different points for viewing the race are indicated by a series of numbers. The finest position is given as the Moat of Ardscull, round which the cars have to make a considerable curve. The next best point is a few miles further on, near Fontstown, and the third just before the turning to the old Kilcullen road. The Rock of Dunamase and the whole road between Maryborough and Kildare affords a fair number of points of vantage, but the part of the course running through the Curragh itself is not looked upon as very favourable.



Mr. Mooers on the Peerless Gordon-Bennett Cup Racer.

MR. MECREDY, the Editor of the *Motor News*, has been very carefully over the course. He states that there are some bad corners on the road. One of the worst is near the Ballyshannon Cross Roads, and there is a great tendency for cars in negotiating it to turn off into the neighbouring field. This field is owned by a tenant farmer, between whom and Mr. Mecredy the following conversation took place. The farmer remarked: "Bedad, I think I'll have a motor car myself this year." "How's that?" said our friend. "With any luck that field of mine ought to catch one or two of them," was the laughing response.

MR. MECREDY on his trip has been having the same trouble with motor spirit through too high gravity that has been experienced in this country. He has found that when engines will not start owing to being provided with this class of spirit (particularly on a cold day) the trouble can be got over by what he terms "hot fomentations to the carourettor." This means wrapping up the carburettor in cloths and pouring kettles of hot water over it.

BIOGRAPH photographs are to be taken of the race by the Biograph Studio.

ALEXANDER WINTON, on Wednesday last, the 6th inst., on the Cleveland track, covered a mile (standing start) in 1 min. 2 sec., beating his own best time.

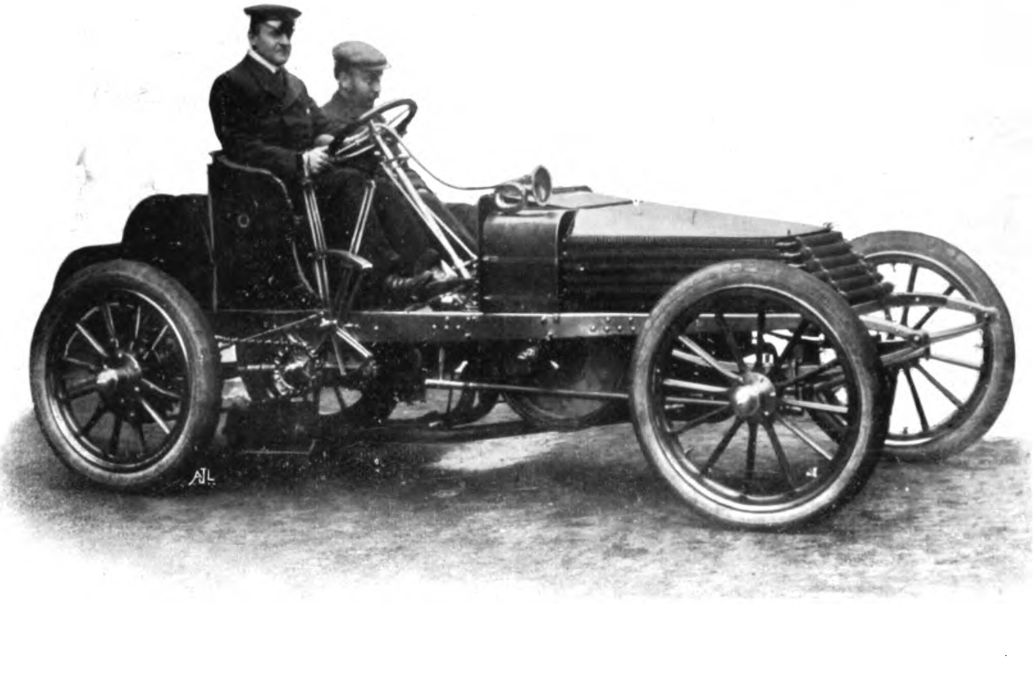
THE actual starting and finishing point for the race is situated about a mile towards Athy from the Ballyshannon Cross Roads.

"CARBAD TEINTE," pronounced "Corrabadh thighenthe," is, upon the authority of Mr. R. J. Mecredy, pure Irish for "Automobile." Will someone now help us by letting us know how to pronounce the form of pronunciation given above?

PARIS-MADRID.

THE total distance for this race is 1,307 kiloms.—divided into three stages. The distance from Versailles to Bordeaux is 552 kiloms. From Bordeaux to the Spanish frontier at Behovia 212 kiloms., and from Behovia to Madrid 543 kiloms.

Official notice has been issued that disqualification will follow the indulging in excessive speeds by competitors before the event over the route. This disqualification will extend to all cars of the same make as that of any person who may be proved to have been guilty of the offence. We presume this refers only to cars of the make entered by the manufacturers personally, otherwise the regulation may have rather far-reaching and unjust results. Quite a crowd of competitors are driving over the course, amongst these being Mr. Charles Jarrott, who has been taking a "look round" this week. M. Fournier, accompanied by M. Georges Prade, of *L'Auto*, is also carefully inspecting the entire route. At the time of writing, fifty-eight Tourist cars are entered for the start for this section next Thursday.



Lieut. Mansfield Smith-Cummings' 50-h.p. Wolseley Racer, the owner driving and Mr. H. Austin seated beside him. We gave a view showing the other side of this vehicle last week, Mr. Girling, one of the Wolseley Company's skilled drivers, being temporarily in charge of the car at the time when our photograph was taken. This car is now in Paris preparatory to taking part in the Paris-Madrid Race.

IT is proposed to hold Quarterly 100 Miles Trials for electrical vehicles on the same lines as those for petrol cars.

MILAN to Turin, a distance of 145 kilometres, is the road selected for a race for motor bicycles taking place on the 24th inst. There will be two classes, one for machines weighing over 50 kilogs., which will be allowed four hours for the course, and the other for machines under 50 kilogs., five hours being allowed for this class. Each class will have categories for professionals, amateurs and veterans.

The A.C. of America Commercial Vehicle Contest.—New and final rules have been issued by the A.C. of America for this important contest, which will be held on the 20th and 21st instant in New York and its suburbs. As amended the classification will provide for three divisions, for electric, steam, and petrol vehicles, each sub-divided into 6 classes, viz.: (1) cars to carry a dead load of 750 lbs.; (2) 1,500 lbs.; (3) 3,500 lbs.; (4) 6,000 lbs.; (5) 10,000 lbs.; (6) 20,000 lbs. Each vehicle must carry a dead load of at least 50 per cent. of its own weight with all supplies on board, in addition to the driver and observer. The distance for the first three classes will be 40 miles each day in three stages, and for the other three classes 30 miles each day in two stages, a compulsory stop of 10 minutes being made at the end of each stage. The first day's run will be a non-stop run for each stage. On the second day the same route will be covered as on the first day, with the following compulsory stops, at each stop the vehicle being required to pull up to the kerb and come to a full stop. Class 1 and 2, 100 stops each; Class 3, 50 stops; Class 4, 25 stops; Class 5, 10 stops; Class 6, 5 stops. A great point of the Trials is to demonstrate what motor vans can accomplish working under ordinary commercial conditions, but as it is specified that the load shall not be changed during the continuance of the contest, we hardly see how the provision of working under ordinary conditions can be arrived at, as with ordinary delivery vans the load at each stop would necessarily be changing more or less. Three medals in each class will be awarded, based on economy in cost of operation and time consumed in covering the route. Electric vehicles will be allowed one stop for re-charging batteries, the time of such stop being recorded against the vehicle, and in like manner the time taken by steam and petrol vehicles for replenishing water and fuel will be debited to each vehicle.

The Thornycroft Racing Launches.—The Thornycroft Company are building two petrol launches with which to compete in the International Motor Launch Race in Ireland in July. The hulls are being constructed of wood, and have been designed on torpedo-boat lines. Wood has been adopted, in spite of the obvious desire to save weight, for, although steel of the necessary strength might be slightly lighter, yet it is considered inadvisable to use such very thin metal as would be required. One of the boats is about 30 feet, and the other about 40 feet, long. We understand that the petrol engine in the one will have four cylinders and in the other eight cylinders. They are so constructed that they will run safely at a speed of about 1,000 revolutions per minute if required. The cylinders of both engines have the same bore and stroke, viz., 6-inch and 8-inch, respectively. There appears to be a certain amount of doubt, at present, as to whether the larger launch will be completed in time for the race, but we sincerely hope that fortune will favour this enterprising Company, and that the boat will be one of the starters; for it ought to prove an uncommonly speedy craft. We hear that the Company have an unusually satisfactory reversing gear—an important consideration in all petrol-driven boats.

A. HANSON, a Minneapolis motor cyclist, proposes to try and ride, on a Mitchell machine. 1,000 miles in 24 hours, on the Garfield Park Track, Chicago.

A 15-KILOM. hill climb is announced for May 17th on the St. Etienne and Bourg-Argental Road. The gradients of the hills in this event range from 5 to 9 per cent.

THE Swiss Automobile Club, following the lead of the British Club, announce that their Speed Kilometre fixture for May 18th will take place whatever the weather may be.

ENTRIES for the Belgian Circuit des Ardennes are beginning to mount up, and are now getting on towards 100. Amongst those who have already entered are Mr. Charles Jarrott, Mr. Heath, Mr. Mark Mayhew, two Wolseley cars, and two Humber bicycles.

THE exact distance of the Two-Days' Non-Stop Trial of the Scottish Automobile Club for May 13th and 14th, will be $402\frac{5}{8}$ miles, this being apportioned as follows:—For the first day to Leeds, $211\frac{7}{8}$ miles; and from Leeds to London on the second day, $190\frac{3}{4}$ miles.

MOTOR pacing was permitted for the first time by the N.C.U. on Saturday last in the Southern C.C.'s six hours' open bicycle race held at Herne Hill. Meredith was thereby enabled to establish new records, his distance in the six hours being 180 miles 1,220 yards.

Exelberg Hill Climb.—This annual event was held under the auspices of the Austrian Automobile Club on the 3rd inst. A good number of entries were received. Competitors were started at intervals of two minutes; in addition intervals were allowed between Class 1 and 2 of five minutes, between 2 and 3 ten minutes, and between 3 and 4 five minutes. The record for the hill (4·200 kilom.) of 5 min. 28 sec. on a motocycle was not beaten. The best times were:—Class 1.—Motobicycle: 1, Laurin-Clement, 5 min. $33\frac{4}{5}$ sec. Class 2.—Voiturettes, 250-400 kilogs.: 1, 8-h.p. De Dion-Bouton, 9 min. $30\frac{3}{5}$ sec. Class 3.—Light cars, 400-650 kilogs.: 1, Darracq and 24-h.p. Spitz (tie), 5 min. $32\frac{2}{5}$ sec. Class 4.—Cars, 650-1,000 kilogs.: 1, 10-h.p. Serpollet, 5 min. $55\frac{3}{5}$ sec.; 2, Mercedes, 6 min. $44\frac{2}{5}$ sec. The Spitz was driven by Hieronymus and the heavy cars by Comte Wimpfen (Serpollet) and Comte Boos-Waleck (Mercedes).

THE LADIES' AUTOMOBILE CLUB.

IT has now been formally determined to found an automobile club for ladies under the title of the Ladies' Automobile Club of Great Britain and Ireland. The formal decision was arrived at at a meeting held last week at Lady Beatrice Rawson's house, 116, Park Street. Lady Cecil Scott Montagu occupied the Chair, and explained the advantages which were likely to accrue to lady automobilists, both from a social and a technical point of view, from the formation of this body. The Club will be supported strongly by the A.C.G.B.I., and, by means of a guarantee promised by the parent Club, premises have been arranged for at 110, Piccadilly, and the Club will be open by the middle of the present month. The Duchess of Marlborough has been asked to be President of the Club, and Lady Cecil Scott Montagu, Lady Beatrice Rawson and Mrs. Adair, Vice-Presidents. Lady Cantelupe has been appointed Honorary Treasurer. A Club Committee of fifty members, which will meet for the first time on the 18th instant, was elected at this meeting, consisting of:—Her Grace the Duchess of Marlborough, Her Grace the Duchess of Sutherland, The Marchioness of Winchester, The Countess of Dudley, The Countess of Derby, The Countess Carnarvon, The Countess Howe, The Countess Cairns, The Lady Edward Spencer Churchill, Dorothy Vicountess Cantelupe, The Viscountess Castlereagh, The Vicountess Duncannon, The Lady Cecil Scott Montagu, The Lady Maud Warrender, The Lady Beatrice Rawson, The Lady Wolverton, The Lady Manners, The Lady Llangattock, The Hon. Mary Portman, The Hon. Mrs. St. John Bredrick, The Hon. Mrs. Forster, Lady Jeune, Mrs. Adair, Mrs. Roger W. Wallace, Mrs. Bainbridge, Mrs. T. B. Browne, Mrs. R. Cox. Mrs. J. Broughton Dugdale, Mrs. Elliott, of Clifton Park, Mrs. Murray Guthrie, Mrs. Basil Hoare, Mrs. Charles Hunter, Mrs. Charles Forester, Mrs. Gerard Leigh, Mrs. Lindsay Lloyd, Mrs. M. C. Lloyd, Mrs. Manville, Mrs. Mark Mayhew, Mrs. Carl Meyer, Mrs. Arthur Paget, Mrs. C. Arthur Pearson, Mrs. W. Portal, Mrs. Bruce Porter, Miss Honeyman, Mrs. Schenley, Mrs. Charles E. Shaw, Mrs. Streatfeild, Mrs. Walker, Miss Muriel Wilson, Mrs. Bernard Weguelin.

* * *

A CLUB run by the members of the Manchester Automobile Club to Leasowe was undertaken last Saturday, the Leasowe Castle Hydro, formerly the residence of the Hon. Sir Edward Cust, Bart., being the headquarters for the Saturday night. The hotel, which stands in its own grounds of about 50 acres, lies between the Dee and the Mersey, on the very edge of the Irish Sea. A unique feature of the hotel is the "Star Chamber" smoking-room, fitted up with the original old oak panelling which at one time was in the Court of Star Chamber at Westminster. The pleasure afforded by the exquisite scenery through which the tourists passed was somewhat marred by bad weather, in spite of which, however, ten cars joined in the run. These included: Messrs. S. Brooks, 12 h.-p. Belsize; C. Frost, 12 h.-p. Belsize; A. E. Jones, 9 h.-p. Clement; H. M. Lowther, 5 h.-p. Peugeot; S. Okell, 9 h.-p. James and Browne; W. E. Rowcliffe, 6 h.-p. Daimler; J. Saville, 12 h.-p. Belsize; J. Hoyle Smith (hon. sec.), 12 h.-p. Belsize; S. Wallwork, 10 h.-p. Brush; J. Whittaker, 10 h.-p. Wolseley.

EASTBOURNE will be the Whitsuntide tour rendezvous of the Motor Cycling Club.

THE Ostende Automobile week has been fixed for July 12-19.

A CLUB Dinner for Founder Members of the A.C.G.B.I. will be held on the 26th instant.

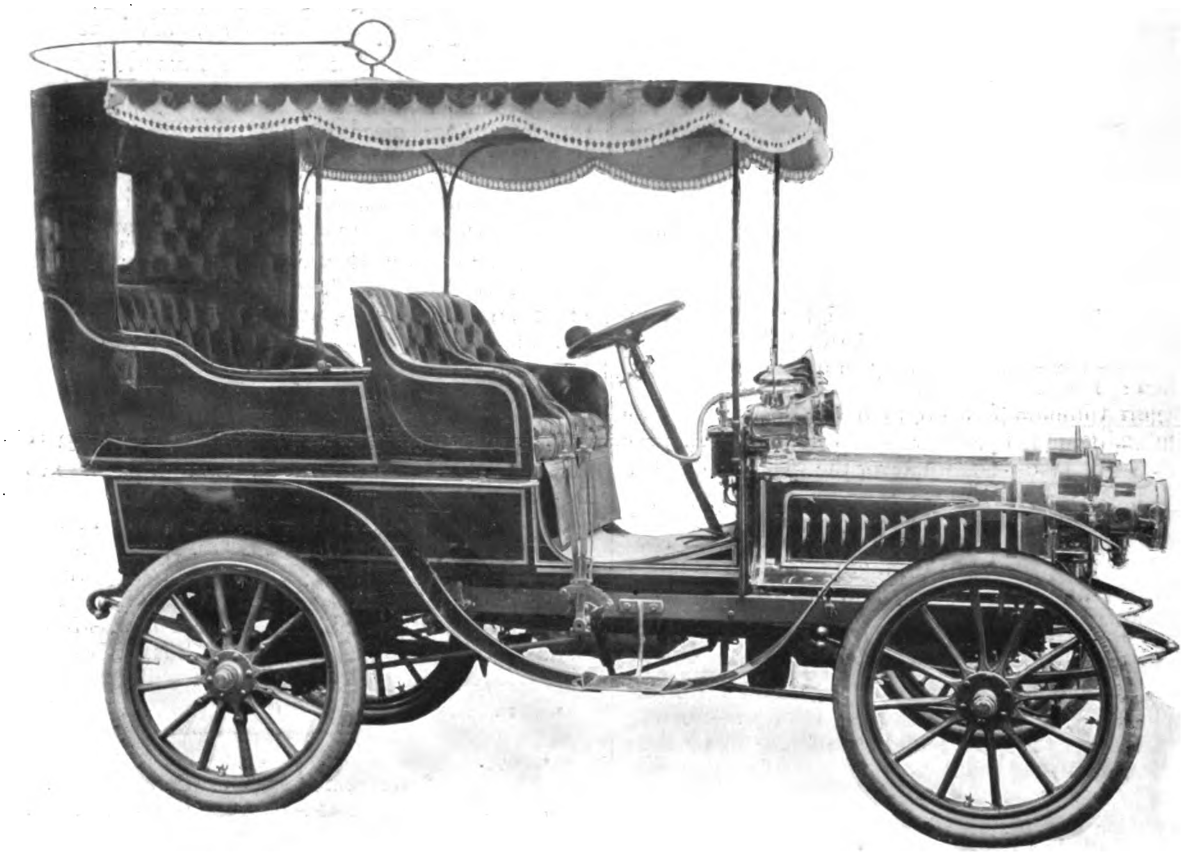
MR. MARCONI, of wireless telegraphy fame, is a candidate for election to the Automobile Club.

MR. E. DANGERFIELD has been elected a vice-president of the Auto Cycle Club and Mr. Todd chairman; Mr. F. Straight has been appointed secretary.

THE Prime Minister's chauffeur was for the third time, on Wednesday last, fined for exceeding the speed limit.

THE Easter Motor Cycle Tour in connection with the C.T.C. proved so successful that the Motor Cycle Committee of the Club are organising a tour in France for Whitsuntide.

THE 27th Annual Stanley Show, for 1903, of cycles, motor carriages, and motor cycles and accessories, parts and machinery, will be held at the Agricultural Hall, on November 20th to 28th.



The illustrations on this page and the opposite one are two Cars, specimens of luxurious coachbuilding by Messrs. Rothschild et fils, recently supplied by the British Automobile Commercial Syndicate. The above is an 18-h.p. Clement Phaeton, and the body is made entirely of aluminium. The front seat on the left swings forward, and gives direct access to the back seats, an arrangement greatly appreciated by ladies. The occupants are protected from dust by the brougham-like portion at the back and by the aluminium canopy which forms a continuation of it above the entire vehicle; there is a large window behind.

KING EDWARD has cemented the friendly relationship with France which he has done so much to foster during his visit to that country in other ways, by finally purchasing a 24-h.p. Darracq car. The vehicle has been specially constructed, and was submitted to His Majesty for inspection on Sunday last at the British Ambassador's residence.

A NEW club is being formed, entitled The West Surrey Automobile Club, with headquarters at Guildford. The following Provisional Committee has been appointed to draw up rules and carry out the preliminary arrangements for the formation of the Club, viz., Messrs. R. W. Buttemer, Baring Gould, Ponsford, Capt. Rouse, Col. Fairclough. The Rev. A. Armitage will act as Hon. Secretary.

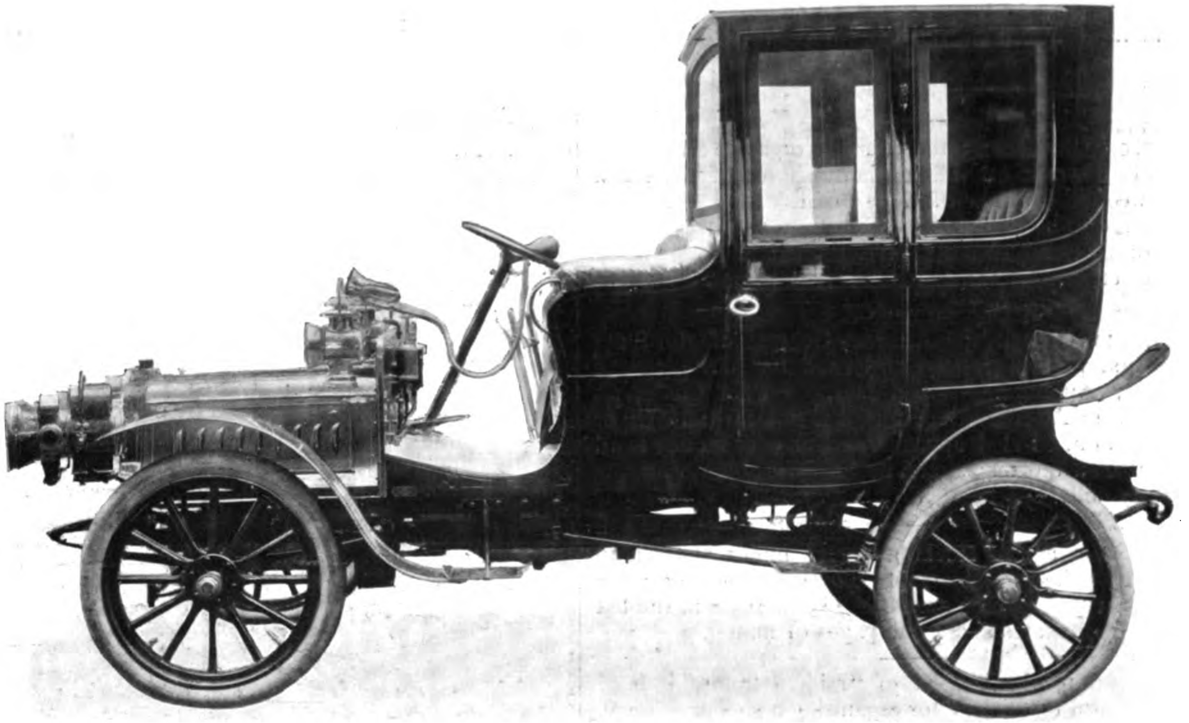
TENDERS for petrol motor vans, with a speed of 10 to 12 miles per hour, and capable of dealing with a ton load, are to be invited by the City of Westminster authorities for dealing with the removal of street sweepings.

FIFTY members of the Automobile Club have been invited by Mr. Kenneth Murchison, Mayor of Hertford, to luncheon at Hertford on the 28th instant, to meet the Chief Constable and Magistrates of Hertfordshire.

THE Earl of Derby has ordered a second electric carriage from the City and Suburban Electric Carriage Company (Limited), and the Marquis of Salisbury has purchased an electric car from the London Electromobile Syndicate.

THE officers of the Cycle Engineers' Institute elected for the ensuing year are as follows: President, Mr. A. S. Hill; Vice-Presidents, Messrs. Hillman and P. L. Renouf; Councillors, Messrs. F. Hulse, A. Craig, H. Austin, C. Sangster, and C. A. Hyde.

TRIALS of reliability for electrical vehicles will be held by the Automobile Club in May, 1904. The trials will be of all parts of electrical carriages but not of the life of the accumulators. The vehicles will have six consecutive days' run and a seventh optional long distance run for which a special extra certificate will be issued.



The illustration on this page shows a 12-h.p. Clement coupé, the body of which is fitted upon an ordinary straight chassis. It is upholstered in dark green morocco, is painted dark coach-green with black mouldings, and the bonnet and wheels are relieved in a lighter shade of green.

THE exclusion of motor cycles and motor cars from Sefton Park, Liverpool, is to be considered at the next meeting of the Parks and Gardens Committee, in consequence of the alleged excessive speed often indulged in in the Park.

ANOTHER terror for automobilists has been added to the roads. As the Earl of Portsmouth was being driven in his motor car to Basingstoke Station on Monday last a Mr. Frederick Molle, of Boscombe, who was accompanied by an attendant at Kempshot, suddenly threw himself in front of the machine and was instantly killed. Mr. Molle, who has been staying in the neighbourhood with a doctor for the past three months, is stated to have been severely affected by mental depression.

REGAL cars can now be seen at Messrs. Evart-Hall's depôts at Manchester, Nottingham, and Brighton.

SCIENTIFIC kite-flying contests are being organised by the Aeronautical Society of Great Britain, to take place at Worthing about the end of June. Some huge creations are expected to be tested, necessitating in some cases the employment of motor cars for giving them a start.

ON State occasions the Lord Lieutenant of Ireland used to be accompanied by outriders. In general he has some sort of police escort. The Irish Constabulary are now learning to ride motor bicycles, as the Lord Lieutenant has taken to automobilism. When he goes out on his motor car his outriders will now be policemen on motor bicycles.

THE chauffeur question in the United States has become so acute that a joint committee to deal with the matter has been formed by the A.C. of America, the National Association of Automobile Manufacturers, and the American Automobile Association.

WITHIN a year an automobile omnibus and dray line, being formed in St. Louis, U.S.A., it is stated, will have between 500 and 1,000 omnibuses and 1,000 to 1,500 heavy drays running. This sounds like a nice modest little scheme that ought to be encouraged.

ITALY does not intend to be left behind in the race to secure a fair share of the trade to be done with automobiles in the near future. An international Automobile Exhibition, to be held in Milan in 1905, is announced to include a huge congress. Automobile tours are to be arranged from Paris, Berlin, London, Madrid, Vienna, &c.

A PROPOSAL has been put forward to organise an electric system of transport on the northern shores of the Black Sea, between the towns of Noworossiisk and Ssuchum. The cars are to be electrically driven from overhead wires, but run on the road and not on rails. It is intended to provide electricity for the system by water power.

AMUSINGLY enough the Attorney-General of the State was the first person arrested and fined for infringing the new Jersey Automobile Speed Law. "This law is no good," said the Attorney-General, "it is not worth the paper it is printed on. I shall appeal." "But your money is all right," returned the magistrate, as he fined Mr. Attorney-General 27 dollars and costs.

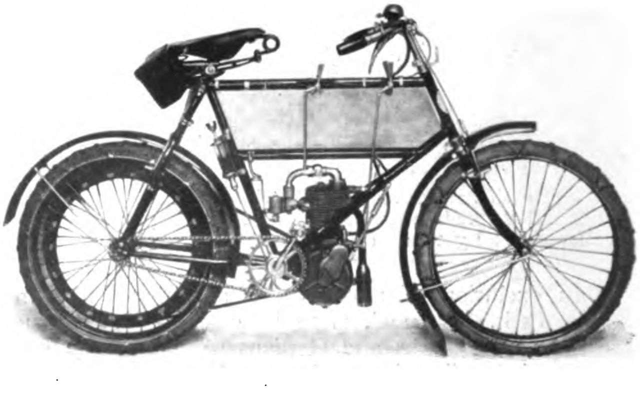
A NEW list of agents stocking Pratt's motor spirit is to hand. Particulars are given of the revised Government regulations regarding motor spirit. The increase in the list of dealers necessitates about 120 pages of matter.

REFERRING to the subject of "railless trams," it is of interest to learn that a Bill for organising a similar scheme, between Stroud and Cheltenham, to that in use in Saxony and at present proposed for Liverpool, is being promoted in the House of Commons. One of the conditions to be attached to the Bill is that private vehicles shall be permitted (on terms) to take current from the line. It is suggested that meters be employed for measuring the energy thus taken.

MESSRS. G. JOHNSON, D. H. Hurley and J. R. Martin, who have hitherto been associated with Mr. C. E. Forman, of the Forman Motor Manufacturing Company, have dissolved partnership and commenced business as motor engine manufacturers at the Alpha Motor Works, Oxford Street, Coventry, where they will trade under the style of Johnson, Hurley, and Martin. Mr. Forman continues the business at Day's Lane under the title of the Forman Motor Co., Ltd.

THE latest application of the rail-ring tractor principle is to the motor bicycle. It has been introduced by a Paris publisher, and is the invention of Mr. Edward Roux of Nevers. The motor bicycle is a front driver, and consists of a wheel which has a certain resemblance to the Singer motor bicycle wheel, containing a petrol engine inside an inner wheel, the difference, however, being that, instead of the engine being mounted on the axle of the wheel, it drives the latter by chain and spur gearing on its interior periphery. This motor wheel, which is supported from the front fork of the bicycle, is mounted inside an outer wheel shod with a pneumatic tyre, this outer wheel forming the rail-ring. The bicycle is said to be exceedingly satisfactory to ride. There being no inconvenient gearing connected with the rear wheel, it can be pedalled in the ordinary way, and is said to be exceedingly easy to manage. The controls are all mounted on the handle-bar.

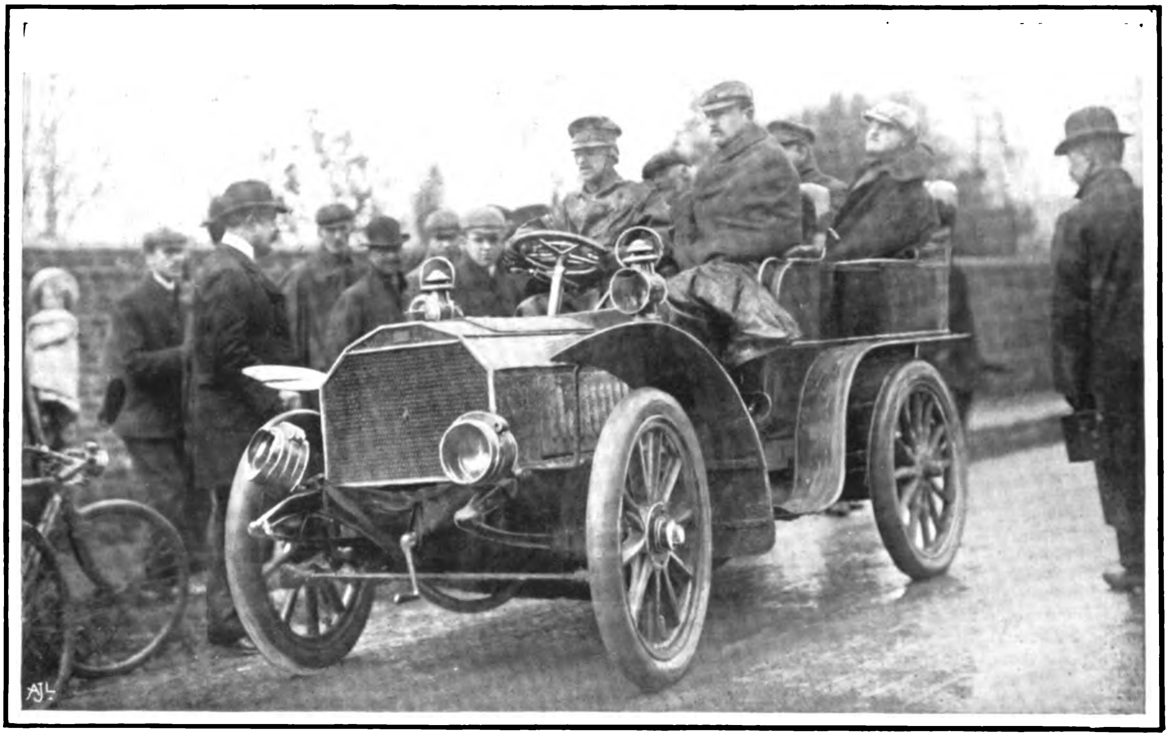
THE Stock Exchange walk to Brighton took place last Friday, when 76 members of the "House" completed the full distance between Westminster Bridge and Brighton Aquarium, the actual times occupied varying from 9 h. 30 m. 1 s. (Mr. E. F. Broad) to 12 h. 58 m. The next two best times were by Mr. G. D. Nicholas (9 h. 33 m. 42 s.) and Mr. J. E. Hammond (9 h. 35 m. 7 s.) The event being a handicap, the actual winners were Mr. S. E. Knight, 10 h. 8 m. 50 s. (handicap allowance, 3 h. 31 m.); 2nd, G. Nickalls, 10 h. 14 m. (allowance, 3 h.); 3rd, Mr. H. G. Thomson, 10 h. 10 m. 14 s. (allowance, 3 h.) The weather was extremely bad throughout, and the roads were very heavy, so that our suggestion last week that consideration might be given by automobilists and others to avoid raising the dust was, we are afraid, unnecessary. Motor cars, as was anticipated, were strongly in evidence, and proved of enormous use to enthusiasts and friends of the competitors in keeping up with the racers and administering to their bodily requirements. At many spots the gathering of cars was quite thick, and one of our pictures shows the scene at Horley, about two miles from the half-way point.



A Motor Bicycle fitted with Parsons' non-skid (described and illustrated on page 42). The non-skid designed for cycles is made specially flat so as not to come into contact with the forks, the mud-guard, the brake, or the chains; the couplings and chain clips are also free from projections of any kind. The side hoops are provided with couplings, enabling the non-skid to be taken off without removing the wheel. The cross-chains are fixed at each end by small bifurcated rivets, and each can be quickly detached without special tools being required. The joints in the hoops are also made with similar rivets, and a safety device is provided for preventing a coupling from becoming detached when in use. The apparatus does not interfere with the action of the usual rim or band brakes, but of course precludes the retention of the old type of spoon brake.

[*Photo by Argent Archer.*]

The Stock Exchange Brighton Walk.—Scene at Horley. One of the competitors is seen taking refreshment in the motor car in the right-hand corner of the picture.



The Stock Exchange Brighton Walk.—Sir George Newnes, Bart., on his car at Horley (with Mr. Frank Newnes sitting behind), after a collision with Mr. Edmund Payne's cycling party, in which one of the cyclists came off rather badly. The off-side lamp of Sir George Newnes' car is seen to have suffered somewhat severely from the impact, and will give some idea of what the effect was on the cyclist.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

AUTOMOBILE CLUB'S QUARTERLY 100 MILES TRIAL.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As you will no doubt have noticed in the last Quarterly 100 Miles Trial, held under the auspices of the Automobile Club, a standard 10-h.p. Chenard and Walcker car conveyed four passengers, weighing complete 20 cwt. 1 qr., over the 100 miles on 1·68 gallons of petrol. If worked out this amounts to 59½ miles on one gallon of petrol, beating all previous world's records.

We therefore beg to enclose copy of a letter we have to-day addressed to the Secretary of the Automobile Club, and should thank you if you would kindly give prominence to same in your columns.

Yours faithfully,
THE WESTON MOTOR SYNDICATE,
April 30th. A. E. COHEN, Director.

[*Copy of letter enclosed.*]

The Technical Secretary,
Automobile Club.

DEAR SIR,—*Re Quarterly* 100 *Miles Consumption Trials.*—We notice in the Official Report given in this week's *Automobile Club Journal,* on the performance of our 10-h.p. Chenard and Walcker car, the following statements:—On the one hand, under the heading "speed," the words "up to legal limit" appear, whilst in the Official Observer's foot-note the remark appears, "the car was driven very slowly, the engine being throttled the whole time, &c."

Seeing that in the regulations governing the 100 Miles Trial, which have been published for months past in the *Club Journal,* the following appears: "Speed.—No speed in excess of 12 miles an hour will be recognised excepting in ascending Dashwood and Aston Hills, &c.," and that since our car left the Automobile Club's premises in Piccadilly at 8.55 a.m., returning, after completing the 100 miles, to the starting point at 5 p.m., according to our representative's report, we submit that we conformed to the Club's regulations, as published, to the letter, and maintained a speed as near as possible equivalent to the legal limit. Either, therefore, the above rules mean nothing, notwithstanding their stringent wording, and are intended by the Club to be openly disregarded, or other cars, which have followed the latter course, have been given an advantage over us who saw fit to abide by them.

In view of the large amount of scepticism which has been shown in this country as to the veracity or accuracy of the repeated records our Chenard and Walcker vehicles have established in France during the last three years, in all Fuel Consumption Trials in which they have entered, and believing that the Quarterly 100 Miles Trial was a consumption trial rather than a test of speed, we endeavoured, by every legitimate means in our power, to establish a record, and, under these circumstances, therefore, we did not wish to exceed the legal limit. We respectfully request, therefore, that, considering the above circumstances, the Official Observer's foot-note that the car was driven slowly, &c., should, in justice to ourselves, be omitted from the Club Certificate, as, so long as the car was driven up to the legal limit, it could not be termed "slowly," if the Club's rules are intended to be observed.

We imagined that the Quarterly 100 Miles Trials were intended to establish the least amount of petrol required to convey four passengers, in a standard car of any make, over 100 miles, similarly to the Fuel Consumption Trials, as carried on annually in France. Under these circumstances, we believe we were entitled, as on the Continent, to take advantage of every bit of down grade where gravity would help us, which, by the way, never compensates by 30 per cent. of the additional fuel required for ascending up grades; notwithstanding this, however, we challenge any manufacturer to transport four passengers in a car weighing complete over one ton, a distance of 59½ miles, on one gallon of petrol, as we did on the 24th of April, whether he take advantage of every bit of gradient or not.

We contend, in conclusion, that it is admitted in trials that every competitor endeavours to do the very best he possibly can, so long as he conforms to the rules, and although we quite admit that an ordinary customer, driving on the road, would scarcely be likely to cover this distance, still we have ample records of our customers daily covering, under ordinary touring conditions, distances in excess of forty miles on one gallon of petrol.

We trust, further, that in order to repair the jeopardy which these remarks have caused us, the above letter will be published in the *Club Journal,* and that you will be kind enough to make it clear that the Observer's foot-note which would appear as an explanation of why this result of 59½ miles on one gallon of petrol was obtained, is not intended as an unfavourable criticism.

Hoping to be favoured with your early reply,
Yours very faithfully,
THE WESTON MOTOR SYNDICATE,
April 30th. A. E. COHEN. Director.

IDENTIFICATION NOT NECESSARILY NUMBERING.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I observe with much regret that it is becoming common to speak of "*numbering* proposals"—"identification *numbers*"—"*numbering* legislation," &c., &c. Thus those who are in favour of means of identification are held up to scorn as being in favour of autocars being placed on a par with "street cabs and omnibuses." Now, sir, I am very strongly in favour of means of identification, and am equally strongly opposed to any legislation which will compel the autocarist to place large figures on his car. If this is what is proposed, I shall unhesitatingly vote against it.

While I hold that the misconduct of many persons driving autocars justifies the demand for means of identification, if the speed limit is to be removed, I think that the use of a name, selected by the owner, is the proper mode of providing for identification, although it may be convenient to have a number opposite the name in the register, and in the licence issued.

Therefore I would earnestly beg of writers in or to the Press to abandon the word "numbers" in referring to the matter, and to speak of "means of identification." If the words "numbers" and "numbering" are constantly flourished before legislators and the public, it will come to be assumed that this is what those who favour means of identification are willing to submit to, which is certainly not the case.

I am, &c.,
Edinburgh, May 2nd. J. H. A. MACDONALD.

LAW REPORTS.

Motor Car Mechanism Case.—Damages for Delay in Delivery.—Mr. Justice Kennedy delivered judgment on the 1st inst., in the King's Bench Division of the High Court, in the case of Roots and Venables *v.* Allday and Onions, of the Matchless Works, Birmingham. He said this was an action by the plaintiffs, who were engineers and motor car makers, of London, to recover damages from the defendants for breach of contract in connection with the delay in delivering six sets of motor car engines. He should assume that if the engines had been delivered as expected, the plaintiffs would have made a profit of £50 for each car, and, therefore, he would give plaintiffs £250 damages for the delay in the five engines and the return of the £100 paid as deposit. As to the counter claim, in his opinion there was no delay caused by any act of the plaintiffs, and, therefore, judgment would be for the plaintiffs on both the claim and the counter claim. He understood an arrangement had been made by which the five mechanisms in question would be completed by the defendants and delivered to the plaintiffs within two months, the plaintiffs to pay half the contract price for them. Judgment would therefore be for the plaintiffs for £350 with costs, except in regard to the first claim made by the plaintiffs, and in regard to the special damages which plaintiffs had claimed. Judgment accordingly.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories either as their principal or part of their objects.]

Kreiger Electric Carriage Syndicate (Limited).—Capital, £30,000 in £10 shares.

World's New Accumulator Company (Limited).—Capital, £7,500 in 1s. shares. Object, to manufacture electric accumulators, cycles, motor cars, &c.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published May 7th, 1903.

919. M. CRAWFORD. Variable speed gear.
1,069. R. E. VON LENGERKE and T. W. MEANLEY. Self-propelled road vehicles
8,888. W. J. DAVY. Steam generators.
10,344. A. W. BRIGHTMORE. Motor road vehicles.
10,631. J. LATILLE. Change-speed gear.
12,217. C. E. DURYEA. Steering gear.
12,233. R. A. CORDNER. Variable speed mechanism.

THE AUTOMOTOR JOURNAL

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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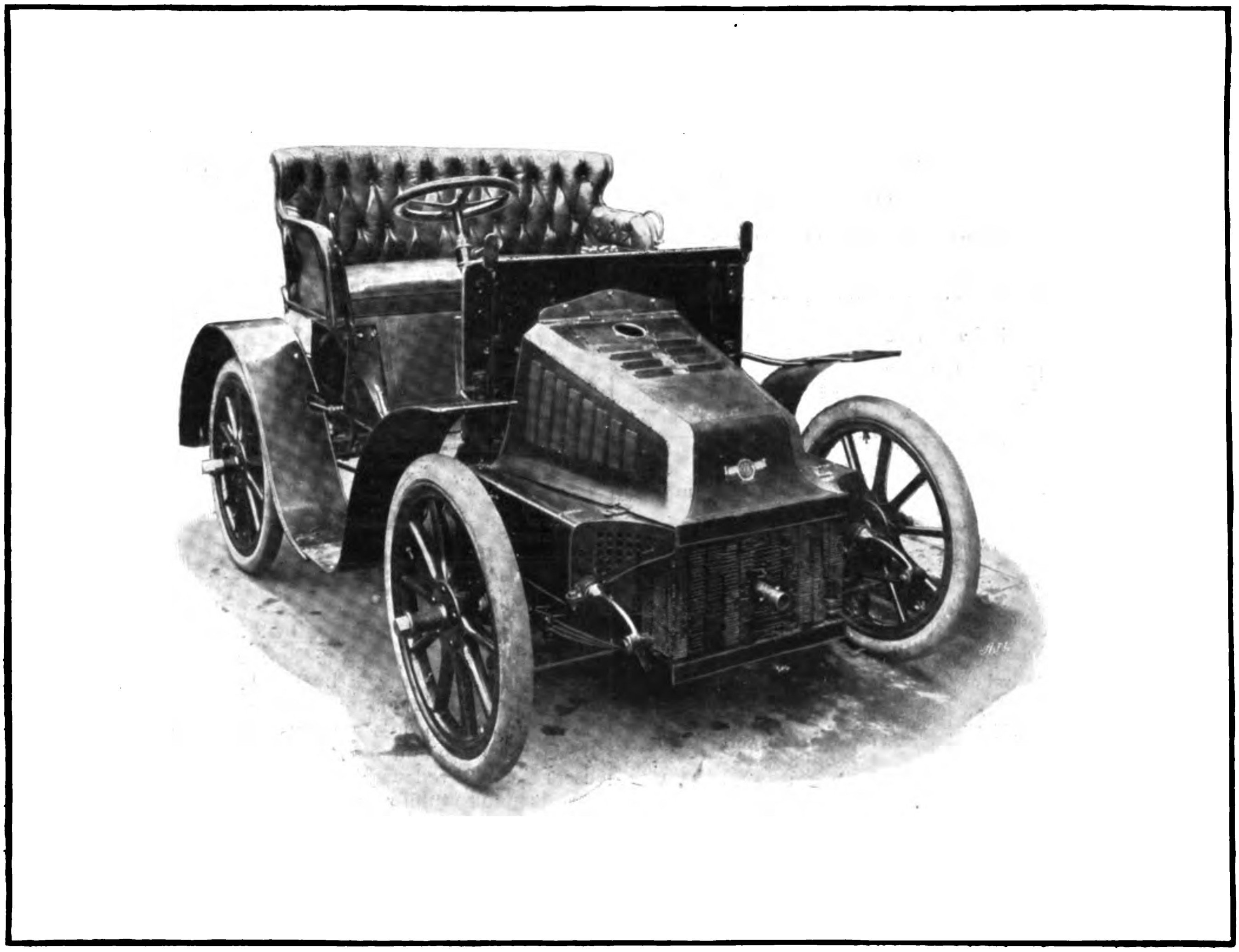

A 6½-H.P. CROUAN PETROL CAR. (*See page* 497.)

THE AUTOMOTOR JOURNAL.

Telephone No.— 1828 Gerrard.
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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
May 16 ...	...	Sheffield A.C. Hill Climb, Padley Wood.
May 18 ...	...	"Mechanical Road Carriages," by W. Worby Beaumont, M.I.C.E. (Cantor Lecture).
May 23 ...	...	Scottish Auto Club Hill Climb.
*June 13 ...	...	Gymkhana at Ranelagh.
June 20 ...	...	Manchester Auto Club Hill Climb.
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park.
July 6 ..		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy.
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork.
		Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
July 24-25	...	Southport Speed Trials.
*August 10-22	...	Tourist Motor Bicycle Reliability Trial.
*September	...	The 1,000 Miles Trial.
1904.		
	...	*Light Van Trials.
*Feb. 12-24	...	Crystal Palace Exhibition.
May. ...	...	Electrical Vehicle Trials (6 days).

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.		
May 16-24	...	Stockholm Exhibition.
May 18 ...	...	Speed kilom.—Geneva (Swiss A. C.).
May 24, 25, 26	...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May 25-30	...	Hanover Alcohol Van Trials (German Agricultural Society).
June 18, 19, 20	...	Automobile Club Fêtes—Paris.
June 18-28	...	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18 ...	...	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21	...	Circuit des Ardennes.
June 28 ...	...	Laffrey Hill Climb.
July 5 ...	...	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 12-19	...	Ostende Automobile Week.
July 19 ...	...	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16	...	Race Trelex-Saint-Cergves (Swiss A. C.).
Sep. 6-13	...	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September	...	Udine Exhibition (Italy).
Oct. 15-21	...	Leipzig Exhibition.
Nov. 15 ...	...	German War Office Alcohol Heavy Vehicle Trials Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

THE STORAGE OF PETROL.

WE publish elsewhere the new regulations which have recently been introduced by the Home Secretary for determining the conditions under which petrol may be stored. They are much less onerous than the old ones, but the most important concession which is made to petrol users is connected with the granting of licences. Anyone who is able to fulfil all the conditions imposed in the fourteen rules need not have a licence. But if his circumstances necessitate his infringing Regulations 4, 5, 6, or 7, then he must apply for a licence. The local authority officers who grant these licences are allowed a wide discretion, and they have power to licence the storage of as much as 60 gallons of petrol under practically any conditions which they regard as reasonably safe. We may take it that this concession has been made by the Home Office partly through recognition of the increasing importance of the automobile industry, and partly in consequence of the fact that owing to the increased care and comprehension with which petrol is now generally handled, accidents have become fewer and fewer.

THE VOTE.

(1) Provided that the three following concessions are obtained:—
  (*a*) Abolition of the specific speed limit,
  (*b*) Alteration of the law as laid down in Sutton *v.* Mayhew,*
  (*c*) Raising of the tare limit.
Are you in favour of identification of motor cars by means of numbers or names conspicuous when the cars are in motion?
(2) Are you in favour of nothing further being done by the Club at present to promote legislation?

The following question (3) *is added at the request of Lord Russell, Captain Deasy, and Mr. Robert Todd, but against the views of the majority of the Legislative Committee, who consider it a mere waste of time to propose small name-plates which would be conspicuous only when a car is stationary. Neither the Government nor the public would, it is considered, for a moment accept the suggestion as a satisfactory solution of the difficulty.*

(3) Are you willing in exchange for the removal of the specific speed limit to consent to the following additional restrictions?:—
  (*a*) Small and inconspicuous identification plates,
  (*b*) Certification of drivers,
  (*c*) An increase of the penalty for automobilists guilty of serious offences, such as giving false names and addresses or endeavouring to avoid identification after causing an accident.

We reproduce above the three questions which have been sent round to all the members of the club, the Motor Union, and such other automobilists as the officials of the club have ascertained the addresses of, in order to obtain the views of the whole automobile community on the three alternative legislative proposals on which we commented last week and on previous occasions. The first and third questions summarise the leading features of Mr. Scott Montagu's and Earl Russell's Bills. We have already dealt sufficiently with these rival proposals to render further discussion of their merits on our part unnecessary. We would only point out that the voters must write one "Yes" but two "Noes" in the answers column, as the three proposals are mutually exclusive.

The voting papers are accompanied by two memoranda, one of which has been prepared by the Club Committee and the others by Earl Russell, Captain Deasy, and Mr. Todd. Both memoranda are skilful *resumés* of the arguments put forward at the meeting by Earl Russell on the one side and the Club Committee on the other. To those who are likely to be induced to vote for his proposals by the skilful and specious memorandum which Earl Russell and his friends have drawn up, we can only recommend the perusal of the articles we have devoted to the subject in our issues of May 2nd and May 9th.

In reference to the proposed numbering of motor vehicles, a circular has been sent out by an electric carriage Company, proposing that as electric vehicles are not capable of high speeds they shall be exempt (whatever may happen to other conveyances) from ever being compelled to carry numbers. We have always been very sympathetic to the electric vehicle, and particularly to those who have done so much to make it a practical success, but we really do not think that there is any adequate reason for the proposed exemption. Electric vehicles can go practically as fast as anything else—down hill, and their weight renders them at any given speed in some respects rather more dangerous than other lighter vehicles. The actual speed, however, is quite beside the question. They are mainly town vehicles, and there are plenty of occasions when even twelve miles an hour in London traffic is an excessive and dangerous rate of speed, and any car proceeding at this speed (or even less) through London streets would stand in need of identification, if ever it is necessary. The main object of identification is to prevent improper driving in towns.

PROPOSED LEGISLATION IN THE LORDS.

The Haddington County Council has suddenly become famous. The proposals which it put forward some time ago for the regulation of motor traffic in Scotland have been espoused by the Earl of Wemyss in the House of Lords. These very sensible suggestions, and the fact that the noble Earl is pressing upon the Secretary for Scotland their adoption, may have some effect in determining the provisions of the Bill which Mr. Long promised to introduce. The Haddington Council and Earl Wemyss maintain that it is inconsistent with sound and enlightened policy to place the speed of motor cars under any hard and fast rule, but they very properly insist that they should not proceed through villages or round corners at a greater speed than ordinary horse conveyances, though no such restrictions should be enforced on open roads. The wise men of Haddington, in return for privileges as to speed, are in favour of legible identification. They have found a powerful spokesman in Earl Wemyss. We should not be sorry to see the combination influencing the character of the Government measure.

SPOIL-SPORTS.

We continue to receive letters on the subject of the inconsiderate behaviour of the less desirable class of automobilists—those, that is to say, who use the roads without consideration for other people, leaving long trails of dust and irritation behind them. The effect of their performances in various districts is gradually converting (sometimes, indeed, rapidly) persons who are either unprejudiced, or even friendly, to the movement into active opponents of it. It is, perhaps, of little use to address remonstrances to the class of drivers to whom we refer, for want of consideration for others is their leading characteristic, and they are not likely to be much influenced by appeals to their better feelings. They might, however, bear in mind that as their conduct tends to injure the automobile movement generally, and perhaps cause the imposition of further irritating restrictions, they will be exceedingly likely to spoil their own amusement as well as that of other people.

LOOKING RATHER TOO FAR AHEAD.

Mr. George R. Sims is unable to discuss any subject without being more or less amusing. He is decidedly entertaining on the subject of the locomotion of the future. The problem of street traffic, the task on which the Royal Commission is now engaged, he regards as insoluble, for he says "until we are prepared to allow motor goods trains on the public highways, the van and wagon traffic must proceed mixed up with the electric trams, motor bicycles, 'buses, phaetons, butcher's carts, bath chairs, and perambulators. Only when we raise our eyes to the heavens above is there much prospect of a solution, and there only," says

---

* The case in which it was held that the mere statement of a police constable (without any corroborative evidence) that the car was being driven to the common danger, entitled the Court to convict, although it was admitted by the prosecution that no person or persons were on the highway.

Mr. Sims, "the solution of the London traffic problem lies. Something must go, either the swift traffic or the slow. The probability is that, so far as the roadway is concerned, the swift traffic will disappear. All express traffic will be conducted in the air." Well, it may be that this solution is before us, though we fear it is still very remote. The results of collisions in mid-air will be almost certainly more disastrous than those on *terra firma*, and though there is plenty of room up above, navigators will have to judge direction in three dimensions of space instead of two, and it will be a long time before they learn to do it. Taken seriously, of course, Mr. Sims' prognostications are merely an expression of the despair with which the aspect of London traffic fills everybody. The problem of London traffic will have to be solved, in spite of Mr. Sims, on the ground, and long before his vision of the future is realised.

◆

THE MOVEMENT FOR BETTER ROADS.

THE Roads Improvement Association, almost entirely due to the personal efforts of Mr. Rees Jefferies, has done good service in drawing attention to the defective state of the roads in many places, and above all to the paramount necessity of largely reconstructing the street accommodation in and around the metropolis. It has also occasionally broken a lance with our friends the Tramway Companies. One of the most important services it has rendered to the community, however, was undoubtedly in bringing influence to bear upon the Government, when appointing the Royal Commission to enquire into the London traffic problem, to make the terms of reference sufficiently wide to involve the inclusion of the general road question around the metropolis in the questions the Commission would have to consider.

◆

ALL automobilists are agreed that the future of the automobile movement is bound up with the reorganisation of road management, the improvement of existing roads, and not less with the construction of new ones on an extensive scale. The automobile movement is rapidly becoming, and is unquestionably destined to become, as great a movement as the railway movement, and a movement probably destined to effect as far-reaching a revolution in society. When we contrast the fervour with which railway development was undertaken, and the readiness with which powers to construct separate roadways were accorded by Parliament, together with the very despotic powers for the compulsory purchase of land which were conferred, the supineness with which the problem of constructing new roads for automobile purposes is at present regarded is nothing short of astonishing. Possibly one explanation may be that it is not apparent at first sight how constructors of roads specially designed for automobile purposes could succeed in making such undertakings profitable. It is well, therefore, to resuscitate an excellent suggestion put forward originally by the R.I.A., by which this would be rendered feasible. In Western America and Canada, large tracts of land have been assigned to the railway companies on either side of the lines they have constructed, as part consideration for the expense involved. As the district is developed, owing to railway communication, these tracts of land become more and more valuable. A similar grant in this country to the undertakers of new roads for automobile purposes might solve the difficulty. Land on either side of such roads will rapidly become very valuable. A scheme by which the constructors of the road would be enabled to secure part of this increased value ought to provide means for amply compensating the constructors even without any necessity for taking tolls from users of the roads. It is, however, by no means certain that such tolls could not be exacted. If the future roads are to be of any real service for automobile inter-communication, they must be constructed for automobile use, and horse-drawn vehicles should be kept off them. What the future of the industry really requires is a network of automobile roads fed by the existing roads of the country. On such roads speeds could be attained that would be quite unsafe on the ordinary country roads, where all sorts of traffic are encountered. This is one reason why such roads should be confined to automobile traffic. Automobiles would soon cease to use the ordinary roads except as means to get on to the special roads. This would largely relieve the existing highways, and they would be largely able to return to the stillness and serenity of Lord Lamington's ideal village. But this is not the only reason for so confining them.

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ROADS could be made, in all probability, cheaper, and would certainly be made differently, if they were never to be called upon to withstand the pounding and pulverising action of horse-shoes, to say nothing of the other amenities connected with horse traction. To build the roads required, therefore, would probably prove a very different problem from building ordinary roads as we at present know them. Sooner or later the thing will have to be done. The ideal of the future—the state of affairs in which the automobile will be able to produce its full effect—is a country with its existing roads improved and better managed, and a great system or network of special automobile roads running through it, much as the railways do at present. The existing roads, if properly managed, would then be found ample for the traffic which would remain on them, and their principal function would become that of tributaries to the high-speed automobile roads. It must be remembered, too, that such roads would not be anything like as expensive to construct as the railways. They would at least not need embankments or cuttings. A future in which such a scheme should be carried out would revolutionise life. It would at least make it much healthier through substituting open-air travel in automobiles for locomotion in stuffy, frequently-overcrowded, and badly-ventilated railway carriages.

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QUIS CUSTODIET IPSOS CUSTODES ?

WE publish in our correspondence column a letter from Mr. Ernest de Wilton in reply to Mr. Cohen's communication given in our last week's issue, about the behaviour of the Chenard and Walcker car in the 100 miles' trial, and taking exception to the official observer's remark appended to his report. Mr. de Wilton was the official observer in question and the author of the remark to which Mr. Cohen objected. It is quite plain from Mr. de Wilton's letter that he acted in perfect good faith—a most necessary qualification in an official observer. But it is equally apparent that Mr. de Wilton was under some misapprehension as to the exact interpretation of the rules. As his letter makes plain, he was under the impression that to constitute a non-stop run, not only must the wheels of the car refrain from stopping except in the controls and for traffic, but that the engine must not stop either. There is something distinctly humorous in the situation of an eager competitor, anxious to save every drop of petrol, and throttling or stopping his engine on every practicable down-grade, with an official observer beside him firmly convinced that with every stoppage of the engine he is committing an offence against the rules. Mr. de Wilton further states that the engine was stopped for at least 25 per cent. of the total running time. Well, we have always had a high opinion of the Chenard and Walcker cars, particularly of the engine, but if the construction of the running gear is so perfect that the car can run on its own for 25 miles out of a 100 we feel that our descriptions of the Chenard and Walcker cars have fallen far short of doing them adequate justice.

A RECORD NON-STOP RUN.

WHAT the modern motor car is capable of accomplishing in the way of endurance was well demonstrated on Saturday last by Captain Deasy, of the 16th Lancers, who left the Automobile Club, Piccadilly, on a 20-h.p. Rochet-Schneider car at ten minutes after midnight and made a continuous run through Barnet, Hitchin, Peterborough, Grantham, Newark, Doncaster, and York, to Edinburgh, and from Edinburgh on to Glasgow. The total distance was 427 miles, and was accomplished in 21 h. 20 m., without a single stoppage of any kind except momentary ones for traffic. This run is the longest non-stop which has been made in the United Kingdom, and is a testimonial both to the reliability and endurance of the Rochet-Schneider car, and not less to the endurance of the driver himself.

Captain Deasy, however, is well accustomed to feats of endurance, as he is an explorer of much experience and considerable reputation. Quite recently he spent a long period surveying and exploring the out-of-the-way fastnesses of Thibet, and the work in which he published the account of his experiences there has already become almost a classic on the subject. In addition, he has received the medal of the Royal Geographical Society for his services in filling up, as the result of his survey, parts of the map of Asia which had hitherto remained blank. Captain Deasy is only one amongst a number of men of the highest culture and standing who have thrown themselves enthusiastically into the new movement. It is an encouraging symptom, for the higher the general intelligence which a man possesses the more likely he is, as universal experience shows, to introduce new ideas and new lines of improvement into any new departure of activity which he takes up.

THE PETROL QUESTION.

No subject is of more importance or interest to automobilists than the suitability of the petrol or motor spirit which they can obtain for running the class of engines with which motor vehicles are at present generally provided. We have already referred to the fact that large quantities of motor spirit have been introduced into commerce (without notice), of a considerably higher specific gravity and apparently less volatility than hitherto in use. Difficulties in starting engines and in running them, but particularly in starting them, have been experienced in a very considerable number of cases. Messrs. Carless, Capel and Leonard's petrol has hitherto remained of the same specific gravity as formerly. They have now, however, issued a general notification that the specific gravity of their spirit will in future be raised from ·68 to ·695 or ·700 at 60° Fahrenheit. They state in their circular that this oil is obtained from a different source from that from which they have distilled the petrol they have previously supplied. Of course, it must be understood that the density of a fuel of this kind is not a direct indication of its volatility or combustibility. It is only such an indication in the case of oils of the same source of origin. Within certain limits it is possible to provide a fuel of slightly higher specific gravity without any diminution in the qualities that render it suitable for motor car work. Bearing in mind the importance of the question, we have interviewed Messrs. Carless, Capel and Leonard, and have witnessed the complete distillation in a retort of their new fuel ; we also tested it in other ways and are satisfied that it is to all intents and purposes as suitable for automobile use as the slightly lighter fuel which they have previously supplied. It must be borne in mind that the firm in question re-distil all their petrol from the light oils, which are the first product of distillation of the crude oil, and that the specific gravity and general suitability of the resulting product are entirely in their hands. The public has, in fact, no other guarantee in regard to what it is buying than their integrity, and as far as we have been able to satisfy ourselves we feel convinced that the fuel Messrs. Carless, Capel and Leonard are now supplying is all that they declare it to be. By changing the class of light oil from which they are distilling, they appear able to supply a fuel which, though slightly heavier than formerly, is equally as volatile and combustible. At any rate there is no doubt that it distils perfectly in a retort without leaving any discoloured residue and evaporates on a warm surface with the same rapidity and completeness as their former product.

THAT Messrs. Carless, Capel and Leonard have been compelled to take this step is a proof of what we have long previously asserted (AUTOMOTOR JOURNAL, Vol. IV., page 349), that the amount of volatile fuel obtainable from existing oil fields is not unlimited. It emphasises also the importance of automobile engineers seriously directing their attention to the question of utilising the heavier fuels for automobile engines.

THE MOTOR VOLUNTEERS.

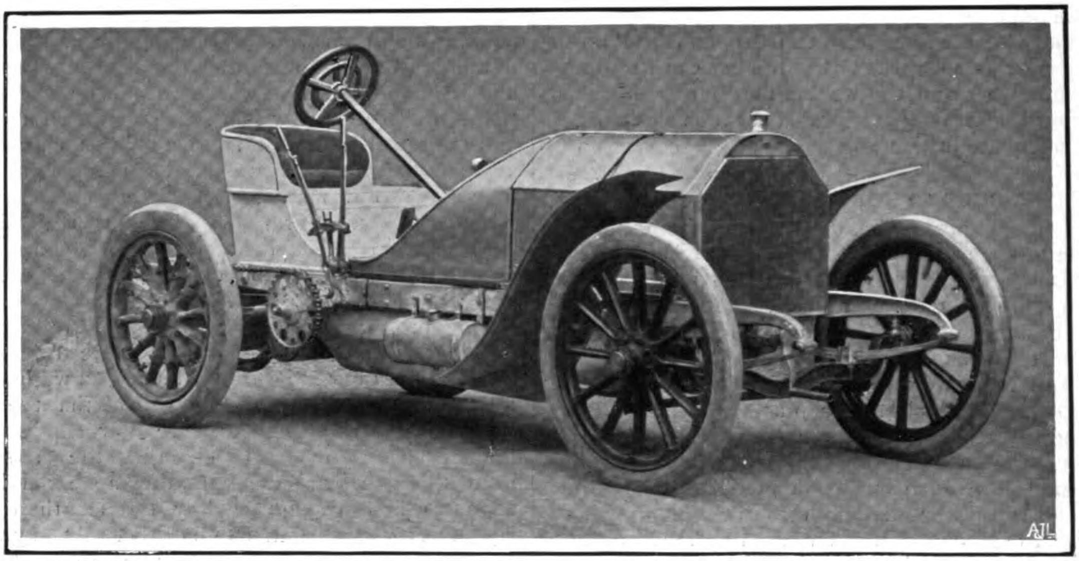
IN last Friday's *Gazette* (May 8th), the first official notice was made of the appointment of Mr. Mark J. Mayhew, late Lieut. Middlesex Imperial Yeomanry, to be Lieut.-Col. of the Motor Volunteer Corps, and to command under Paragraph 55A, Volunteer Regulations.

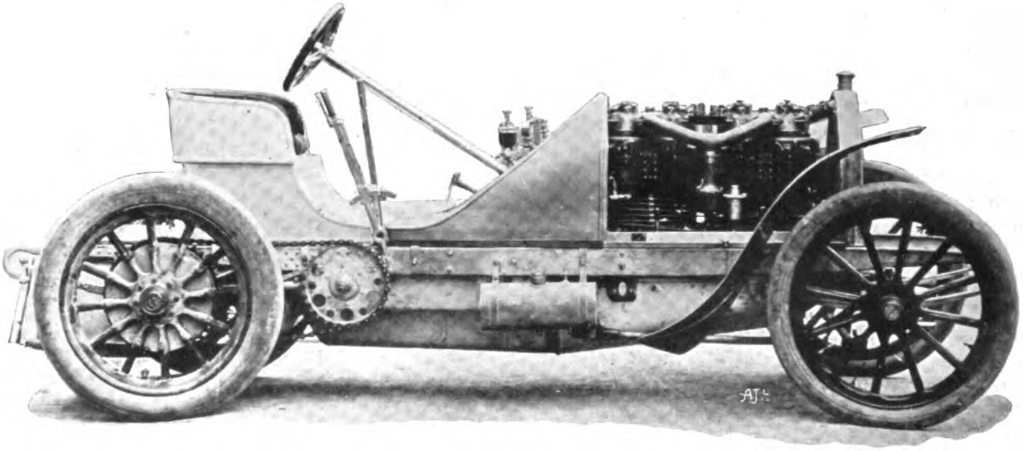
THE first enrolment of members took place on the same evening, when a large number of gentlemen officially entered the new branch of His Majesty's Service.

GENERAL OLIPHANT, commanding the Home District, 4th Army Corps, has applied for the use of motor volunteer cars, one car per day, from May 12th to May 30th, and Captain Schlosser, signalling officer, Eastern District, 4th Army Corps, has applied for the use of a motor volunteer car for his long distance signalling operations during the Whitsuntide holidays.

LIEUT.-GEN. LORD GRENFELL, accompanied by Col. Crabbe, his chief staff officer, together with his aide-de-camp, drove down from London to Woolwich last Friday, on a motor car, to inspect the troops and barracks in that garrison. A sergeant in the Royal Engineers acted as chauffeur.

A GORDON-BENNETT 90-H.P. MERCEDES RACER.





THE accompanying illustrations, which we have received direct from Germany, and which are the first to appear in this country, represent one of the 1903 90-h.p. Mercedes cars constructed for the Gordon-Bennett Race. In the first view the car is shown complete with the bonnet in place, and in the other the bonnet has been removed so that the engine can be seen in position.

This machine is in general respects similar to the 60-h.p. model, which we have already described and illustrated. The wheel base is about 3 m., and the wheels, which are of equal size, have Continental tyres. The weight, as we have already indicated in our columns, is well under the 1,000 kilogs. limit. The dash has been considerably modified in shape, and, as will be seen, does not project above the bonnet. The seat is unusually far back, being but little in front of the rear axle.

The engine is practically identical with that on the 60-h.p. car, except that it is larger. The bore of the four cylinders is 165 mm., and the stroke is the same as on the 60-h.p., viz., 150 mm. It is not yet known what the b.h.p. of the engine will be at the time of the race, as, of course, the nominal h.p. is to a great extent arbitrary. The honeycomb radiator is unusually narrow.

LAST Friday the King drove down by motor car from London to witness the racing at Kempton Park. Shortly before the King started Mr. A. J. Balfour called at the Palace, and was received in audience by His Majesty. Was it a loyal feeling which had prompted the Prime Minister, regardless of the fact that the King can do no wrong, to call and give timely warning to his Sovereign of some carefully-laid police trap on the road? We wonder. Mr. Balfour's recent experiences in the same direction have doubtless occasioned him a good deal of feeling on the subject.

THE CROUAN PETROL CAR.—Part I.

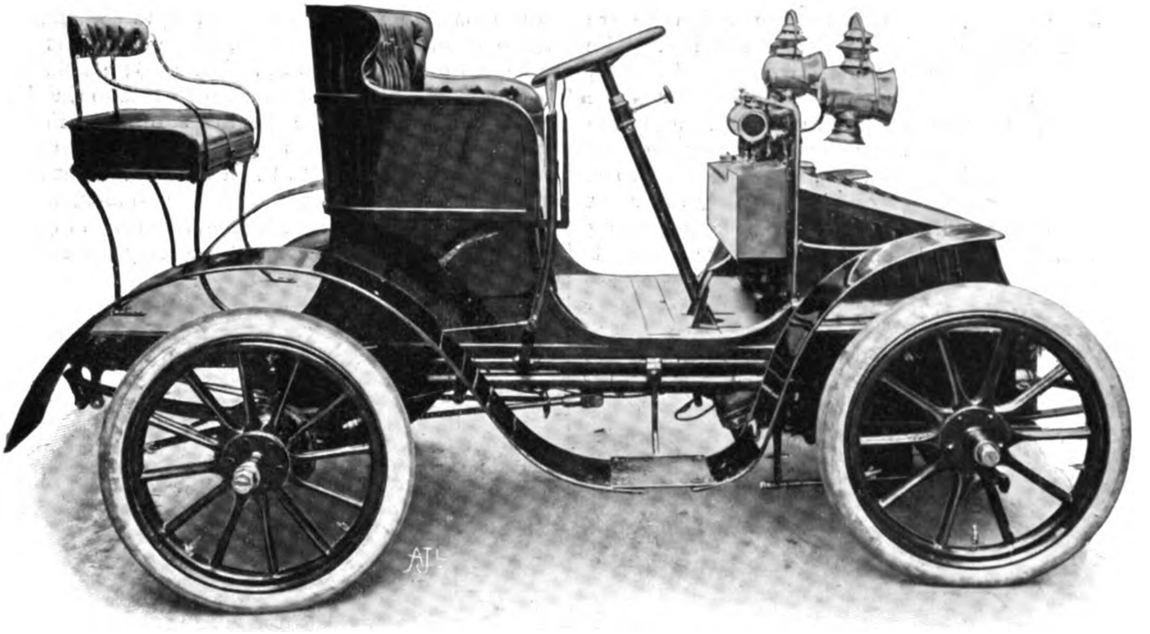


FIG. 1.—The 6½-h.p. Crouan Car with Spider Body.

THERE are few inventors who have devoted more time and money to the automobile problem, and particularly to the development of petrol engines, than Mons. Crouan, of Paris. He was, indeed, one of the early pioneers of the movement, and was amongst the first to build a successful petrol car. Although his name has not hitherto been brought prominently into public notice in this country, yet many of his inventions are well known to engineers who have made a study of motor car construction, and it is probably not too much to say that he possesses as wide an experimental knowledge of this particular subject as any man living. His work is always, therefore, interesting, and even if some of his special devices have proved themselves to be more ingenious than commercially useful hitherto, yet others of them have, during recent years, been reinvented time after time, or adopted by other and more pushing men.

Mons. Crouan has always been an advocate of the horizontal semi-balanced type of motor, and has adhered to this form of construction from the first; whether fitted with two or four cylinders, these have been arranged on opposite sides of a central crank-chamber, and have lain transversely in the car. The cylinder on the one side has not been quite opposite to that on the other, and the cranks have been arranged at 180° from one another, so that the piston on the one side travels inwards at the same time that the piston on the other side does so. By taking advantage of this construction he was able to increase the volume of the explosive charge in the cylinders, although he does not now employ this system—possibly because of the difficulty of lubricating properly without getting the oil mixed with the explosive charge. By his arrangement, however, the explosive mixture was drawn into the crank-chamber by both pistons as they receded into the cylinders and was displaced by them during their return strokes. The nearly opposite cylinders worked alternately, so that an increased charge was forced into the combustion chamber of one only at a time. As we have said, however, he has not utilised this principle on recent vehicles, although it is obvious that an increased output of power might be expected from it.

One of his earliest ideas was that the time of ignition ought to be automatically advanced as the speed of the engine increased, and this provision has been made so far as we are aware on all motors built by him since then. Originally a single governor was used for this purpose and for automatically regulating the speed of the engine, but in the light vehicles now made the actual speed of the engine is regulated by hand only, and a simple form of governor does the "timing."

As early as 1897 he obtained an English patent for a high-tension ignition plug, in which an annular space was left between the porcelain and the outer metal wall of the plug for a considerable distance from its inner end—an arrangement which is now familiar to a large number of our readers, and has proved very effective for reducing the liability for the plug to become short-circuited by carbon deposits in the cylinder. About the same time, too, he had devised an automatic carburettor which had the same object as the "Krebs" carburettor, about which so much has recently been said. Another automatic carburettor of his, which also aims at keeping the explosive mixture at an equal degree of richness under all conditions, will be described with illustrations presently.

The Crouan cars have recently been made in two different types, the light type and the heavy type. One peculiarity of them all is that five forward speeds are available. In the light cars, which are either of 6½-h.p., or of 12-h.p. according as to whether a 2-cylinder or a 4-cylinder motor is fitted, the different gears are obtained by means of jaw clutches, which alternately bring into play the required train of spur gears. It is the 6½-h.p. light vehicle with which we are going to deal in some detail in the present article. The heavy type of car has a pneumatic change-speed-gear in which the clutches introducing the different gear-trains are operated from a compressed air reservoir, and the pressure is transmitted to them, from it, through an oil medium, the clutch itself and the pipes leading to it from the reservoir being full of oil. In this arrangement the oil is led into the required clutch through holes passing through a hollow shaft upon which the clutches are mounted. The required clutch is brought into operation by longitudinally sliding an inner hollow shaft, into which the oil is led, and thus bringing the holes in it into line with those in the larger shaft. The initial air pressure in the reservoir is obtained by a hand pump. and it is maintained for a considerable period because the waste oil, after doing its work in the clutches, is mechanically pumped back again from the gear-box into the oil system. The "reverse" on this heavy type is incorporated into the main clutch, so that the same number of speeds are available in either direction of travel; an epicyclic form of gear is utilised for giving the "reverse." Of this type there is an 8-h.p. twin-cylinder car, and two 4-cylinder sizes—a 16-h.p. and a 24-h.p. respectively.

One of the 6½ h.-p. light vehicles, fitted with a three-seated spider body, is shown both in our frontispiece this week and in Fig. 1. This car, which usually has larger tyres and a tonneau body, weighs about half a ton instead of 13 cwt., and is very speedy; the engine develops its normal power at about 900 revolutions per minute, and considerably more at the maximum speed at which it is intended to run—viz., 1,200 revolutions per minute. The chassis is shown both from in front and behind in Figs. 2 and 3.

The main frame is of tubular construction, and there is no under-frame. The side members are formed of two tubes, the one of which passes rearward from the dash, and the other, which lies beneath it, passes from about the centre of the vehicle to the front. They are connected, where they over-lap one another, by brackets, into which they are brazed. The front ends of the lower tube carry the engine, and are tied together by it; they are not otherwise connected together except by the radiator, and, to a certain extent, by the front axle through the semi-elliptic side springs, which give the usual suspension in front.

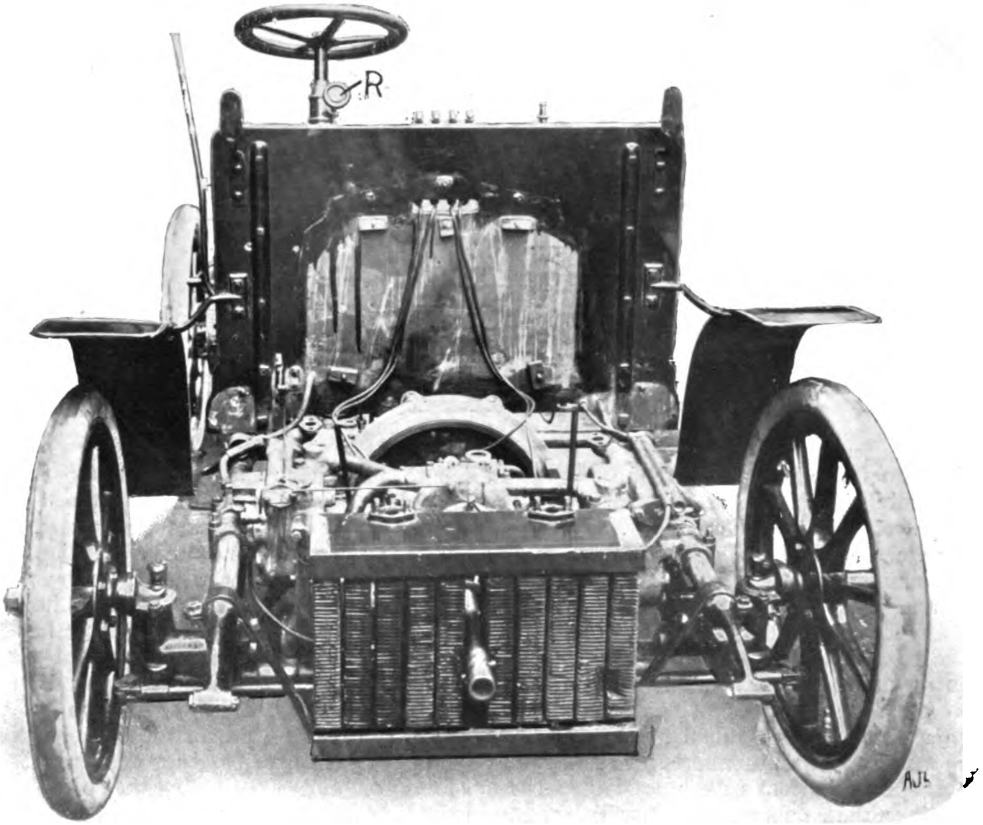


FIG. 2.—Front View of 6½-h.p. Chassis.

Part of the engine, and the main clutch fitted on its shaft, is seen in Fig. 4, and in this illustration also the cover of the crank-chamber, with the half-speed shaft beneath it, is shown separately. The cylinders, A, are bolted to the aluminium crank-chamber, B, and are provided at their outer ends with brackets, A^1, by which they are clamped to the main frame. The cylinders have a bore of 96 mm., and the stroke is 98 mm. The crank-chamber itself is cast with a large opening at the top, with circular openings at its sides for the cylinders to fit into, and with circular openings also at its two ends. The crank-shaft is carried in bearings, which are formed in end plates registering into the openings in the crank-chamber and bolted to it. The front bearing has a solid bush, but the brasses at the back end, as also the whole plate carrying them, are divided diametrically. The top cover, D, not only provides for the bearings near the ends of the half-speed shaft, D^4, but it also supports this shaft in inner bearings secured to its under side. The cam-shaft carries a large spur wheel, D^3, which meshes with one of half the size on the crank-shaft in the front end of the crank-chamber. The cover, D^2, also carries long brasses, in which the rod, E, is free to slide longitudinally. This rod has a fork, E^1, formed in it at its centre ; a square block which rides on a crank pin on the half-speed shaft is free to slide up and down in the fork. In this manner the rod, E, is given a reciprocating motion by the revolving cam-shaft, and it is this rod which operates the exhaust valves of both cylinders.

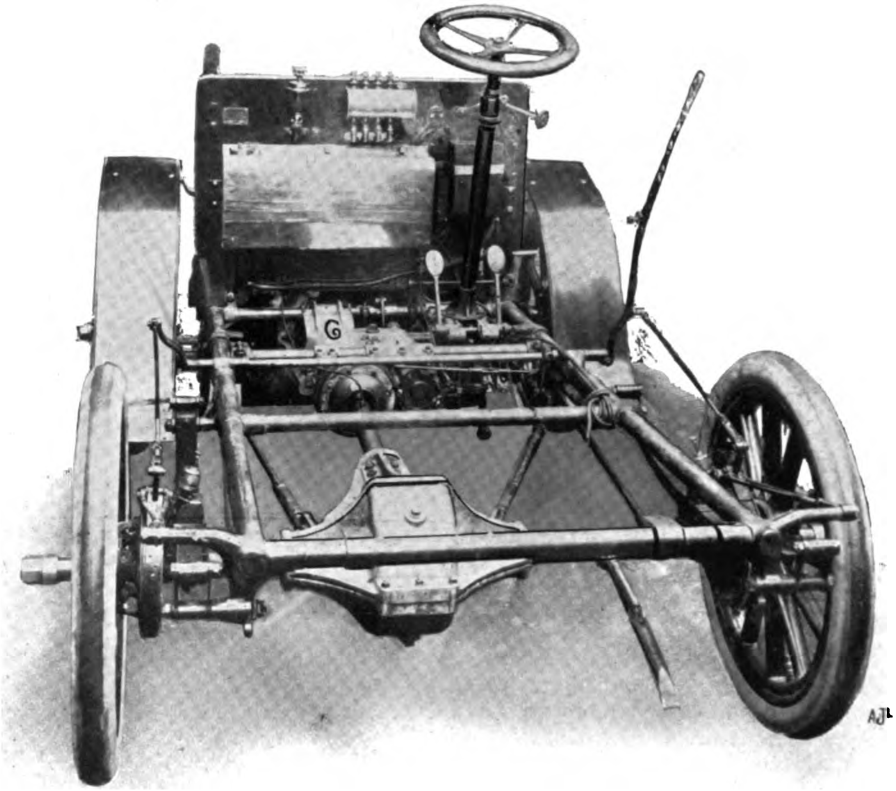


FIG. 3.—Rear View of 6½-h.p. Chassis.

The exhaust valves are fitted in water-jacketed chambers formed in the upper side of the cylinders ; although the two cylinders are not in line with one another yet their exhaust valves are. The forward end of the one exhaust valve spindle, C, is visible in Fig. 4, and it will be noticed that a ribbed inspection cover, C^1, is fitted behind the valve. The valve is normally held on its seat by the spring, E^2, which is in tension and the hooked end of which passes through a hole in the end of the spindle, C.

The cover plate, D, is fitted with a small outwardly opening valve, D^1, so that, as the two pistons approach one another, the air in the chamber can be forced out through it, but that as they again recede it is impossible for the air to re-enter. A partial vacuum is thus formed in the crank-chamber when the engine is running, and there is, therefore, no tendency for the lubricating oil to be forced out through the bearings. The cylinders and the bearings of the crank-shaft are lubricated through pipes from a sight feed fitting on the dashboard, and the oil, after doing its work in these parts, finds its way into the crank-chamber, where it is splashed by the revolving mechanism and is caused to lubricate it thoroughly. The main body of the crank-chamber is provided with oil pockets at the top into which some of the oil is thrown by the connecting rods ; it is allowed to drip from these pockets on to the connecting rods which are specially formed to receive it and to conduct it into the bearings at each of their ends. Their connecting rods and the pistons, together with other parts which will be referred to again presently, are shown separately in Fig. 5.

The inlet valves are placed with their spindles vertical ; they are held in place by the induction pipe fitting which connects them with the carburettor. The ignition plugs, C^2, which are of the high-tension type, lead into the passages communicating from the inlet valves to the combustion chambers. The exhaust box, B^1, lies across beneath the engine and is fixed to it.

The front end of the crank-shaft projects through the radiator (as seen in Fig. 2) and receives the starting handle. The rear end terminates in a flywheel, which forms the middle member of the double-cone main clutch. The clutch connects it with the jaw coupling, J, which engages

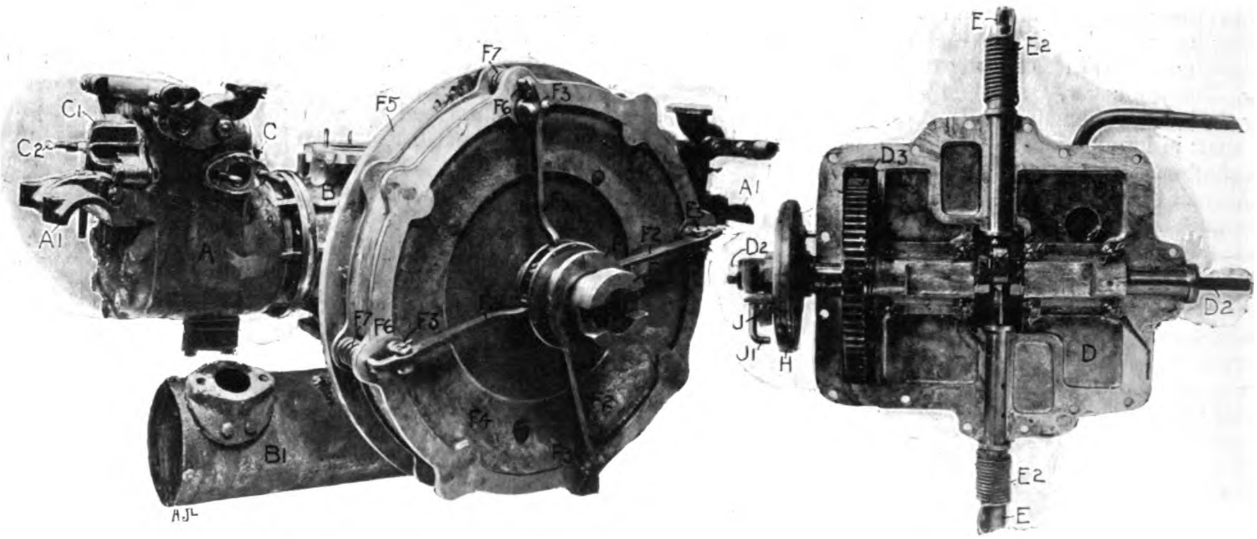


FIG. 4.—The Crouan Engine with Main Clutch, and the Cover of Crank-Chamber with Half-speed Shaft in place.

with the first-motion shaft of the gear-box, G (Fig. 3). Sufficient space is left between the jaw coupling and the clutch for the sliding sleeve, F^1, to move upon. This sleeve rides freely upon it and is engaged by a fork operated by the clutch-pedal. The sleeve, F^1, receives the ends of four levers, F^2, which are pivoted equidistantly at F^3, to the rearward female member, F^4, of the clutch. The front female member, F^5, is connected with F^4 by means of the pins, F^6, fixed to the former, and passing through holes in the rear member. These two members, F^4 and F^5, are also connected by spiral springs, F^7, which normally draw them together, and cause them to grip the cone faces of the flywheel. By this arrangement the clutch does not impose any end thrust upon the shafts, either when it is in or out of engagement. When the sleeve, F^1, is drawn rearward the ends of the levers, F^2, press the clutch member, F^5, forward, by means of the pins, F^6, and the levers themselves draw the member, F^4, in the opposite direction by means of the fulcrum pins, F^3; a large friction surface is obtained. The flywheel on the engine is of unusually small size for the power developed; considering this, it is remarkable how slowly the engine will run—a speed of 120 revs. per minute being possible when running light. (*To be continued.*)

THE progress of automobilism, judged by the Board of Trade returns of the imports and exports of cars and parts, is very remarkable. In April 588 foreign motor cars and motor cycles were imported into the United Kingdom, as compared with 434 in April, 1902, the value being £138,566, against £109,587. The figures for the last four months show an import of 1,999 machines, representing a value of £544,966, as compared with 1,075, valued at £253,549 in the first four months of 1902. Adding to these amounts the value of parts of self-propelled vehicles received from abroad, the expenditure of purchasers in the United Kingdom upon foreign built motors last month was £153,955, as compared with £121,180 in April, 1902, and during the four months just ended £622,098, as against £288,230 in the first four months of 1902.

COMING to the exports what a contrast do we find. The number of cars and cycles of British manufacture exported in April was 50, against 29 in April, 1902, and the total for the four months 219, against 91 in the corresponding period of last year. The amounts represented by these exports of British manufacture were £21,830 for the month and £76,293 for the four months, as compared with £11,533 and £29,691 for similar portions of 1902, and the value of parts of such vehicles exported was £3,672 last month, as against £569 and £11,416 for the four months, as against £5,548 twelve months ago.

LORD CARNARVON was elected a member of the A. C. de France last week.

ON the 14th instant a resolution was before the Council of the London Chamber of Commerce in regard to the very inadequate tare limit which at present exists in respect to heavy motor vehicles. The formal resolutions moved were as follows:—

> That whereas this Chamber is of opinion that the requirements of the commercial, trading, and agricultural communities of this country call for alterations without delay in the regulations relating to the use of heavy self-propelled vehicles upon highways, and in particular:—
>
> 1. That the existing tare limits be removed, and that there be substituted in place thereof a maximum gross moving weight limit of 14 tons, or, if drawing another vehicle, of 4 tons more.
> 2. That the existing speed limits be removed, and that in view of the increasing use of motor omnibuses, the maximum speed limit be not lower than 12 miles per hour for a total moving weight not exceeding 6 tons; nor lower than 6 miles per hour for a total moving weight not exceeding 18 tons.
> 3. That the total tyre width be fixed at a minimum of 2½ inches per ton of gross moving weight.
>
> This Chamber, recognising the importance of the interests involved, recommends that a deputation of the members interested should be appointed to wait upon the President of the Local Government Board with a request that he will take the necessary steps to give effect to the above recommendations.

THE CHABOCHE STEAM CARS.—PART IV.

(*Continued from page* 456.)

The System in Detail.

Having described the construction and arrangement of the various parts, as also their relationship to one another, the special coloured diagram (Fig. 17) which we have prepared will be readily understood. In this drawing all the various portions of the mechanism relating to the fuel-feed, the water-feed, the steam system, and the lubrication system are clearly shown, and the functions of the various parts and of the pipes can be readily distinguished by the colours assigned to them. The fuel connections, as also those for lubricating the engine, are shown in black, the water-feed is shown in blue, and the steam pipes and fittings red. As usual, we have adhered to the same letters throughout the diagram that have previously been used on corresponding parts in all previous illustrations, and, for the further convenience of our readers, we have also appended, beneath, a legend explanatory of the lettering throughout.

The Fuel-Feed.

The flow of fuel through the pipe, A^3, from the supply tank, A, to the engine driven-pump, B, is controlled by the shut-off cock, V^2, this cock being normally closed when the car is not in use, and also being provided so that the pump valves themselves can be examined at any time. The delivery from the pump through the pipe, A^4, leads into the pressure chamber, C. The additional check valve, B^3, is fitted so that the pump valves can be taken out if necessary while the car is in use. The pressure maintained by the pump in the chamber, C, depends chiefly upon the force exerted on its by-pass valve by the spring. The normal pressure in the chamber can, therefore, be regulated by the handle, B^1. It will be understood that at all times when the engine is running the pump, B, is capable of delivering more oil than is actually wanted, and that therefore a certain quantity is usually being by-passed back to the suction pipe. In practice it is not necessary to adjust the handle, B^1, constantly, because the actual fuel-feed to the burners is otherwise controlled, but it is sometimes convenient to do so, as the actual quantity of oil flowing to the burners at any given time is affected by it. The pressure chamber, C, contains a certain quantity of air, which acts as a compressible cushion and has a sufficient volume to continue feeding fuel to the burners, whilst the engine is temporarily at rest for short periods. This air gradually becomes absorbed by the fuel, and it is therefore necessary to occasionally replace the air so lost, this being done by the hand-pump, D^1 (through the pipe d^1 and d^2), or by a tyre-pump attached to the nipple, D^2, provided for the purpose. The pressure gauge, D, is connected with the chamber, C, by the pipe, d.

The fuel flows from the pressure-chamber, C, through the adjustable needle-valve, C^1, and this valve provides the only means by which the heat of the burners can be regulated when the engine is at rest, because at such times there is no steam passing from the boiler, and, secondly, the automatic (thermostatic) valve, E, is wide open. The hand-wheel for the valve, C^1, has four notches cut in its periphery, which alternatively engage in a spring catch. In one of its positions sufficient oil is allowed to pass for keeping the burners alight when the car is standing; in another, the heat of the burners is sufficient for driving very slowly—as in traffic or when coasting down steep hills; the other positions correspond with faster speeds of running, and enable the driver to prevent the burner smoking. This hand adjustment, as in the case of the handle, B^1, does not require constant attention under ordinary working conditions. The oil finds its way through the valve, C^1, then passes through the valve, E, which is normally held open and is gradually closed as the temperature of the steam pipe, Q, increases. It will thus be seen that the valve, E, only comes into play when the engine is running, and that its function is to prevent the steam from being too highly heated, and the generation tubes from being burned. Conversely, it automatically keeps the temperature of the steam high, and normally regulates the fuel-feed. When this valve is closed, the burners are not entirely extinguished, because of the small by-pass which is provided, and through which a small quantity of oil continues to find its way.

The oil is led from the valve, E, by the pipe, E^2, to the distributor, E^5, from which two separate pipes, e^3, lead to the burners, F, the one feeding the three forward burners through the pipes, f^2, and the other feeding the rear burners through the pipes, f^1. The distributor consists of two needle valves arranged so that either or both can be opened at will.

The Water-Feed.

The water contained in the supply tank, G, is led through the cooler, G^1, and the pipe, G^2, to the shut-off cocks, H^1 and J^1, the former of which is a three-way cock, also enabling the tank, G, to be emptied in frosty weather or when otherwise desired. The water is drawn by the mechanical pump, H, through the cock, H^1, and the pipe, H^2, and it is delivered through the pipe, H^3, to the automatic by-pass fitting, K. The hand pump, J, draws its supply through the stop-cock, J^1, and the suction pipe, J^2, delivering it through the pipe, J^3, to the same fitting, K. The water normally passes through the fitting, K, and the pipe, L^2, to the pressure drum, L, where it is stored under a pressure of air as already explained. The pressure tank, L, is also connected with the automatic by-pass, K, by a separate pipe, M, which has a branch connection to the pressure gauge, M^1. The flow of water into the pressure chamber through the pipe, L^2, is controlled by the cock, L^1, which, when the car is in use, is always kept wide open. As soon as the pressure in the chamber, L, reaches a certain point, the water in the pipe, M, opens the by-pass, K, automatically, and the water delivered either by the pump, H, or the pump, J, then finds its way back through the pipe, G^3, to the top of the water tank, G. We have already explained how the normal pressure maintained by the automatic by-pass fitting, K, can be varied by hand, and also, temporarily, by the "accelerator" pedal, K^7; the normal pressure is about 25 kilogs. per sq. cm., and this may be increased by the pedal to about 30 kilogs. The pipe, L^2, is normally in free connection with the generator tubes, through the thermal storage coil, N, and the pipe, P^1, but the connection can be established or cut off at the will of the driver by means of the stop-cock, K^1. When the cock is open the water is free to flow between the pressure tank, L, and the boiler, and, consequently, its flow from the former to the latter depends upon the relative pressures in each. If, through any cause, the boiler pressure were to rise abnormally, the water would be forced back into the tank, L, and at the same time, of course, any further water delivered by the pumps would be forced back into the supply tank. During this time a certain amount of heat will have been stored up in the coil, N, and the pressure in the tank, L, will have also been raised. The water being in this way forced back out of the generator, the steam pressure there would probably soon fall rapidly, and, as soon as it were so to do—as it would if the engine were running—the water would again return from the tank, L, and, on its way through the coil, N, it would take up a certain portion of the heat lost there by it previously.

It will be seen that under ordinary working conditions the water is automatically controlled, and that the steam pressure in the generator tends to remain constant, so long as the load does not vary very greatly. For all ordinary variations of load, such as would occur on a car in a fairly flat country, this device would meet all ordinary requirements. In a hilly country, however, there are times at which the boiler pressure and the pressure in the chamber, L, would increase enormously, as, for instance, when starting coasting down a hill after having climbed up a steep grade. Under such circumstances, therefore, it is necessary for the driver to cut off the water-feed to the generator by means of the cock, K, and for this reason it is placed within his easy reach. When the cock, K, is open, the gauge, M^1, showing the pressure in the tank, L, and the steam gauge, R^2, read practically in unison with one another, but when the cock is closed they show the respective pressures in the tank and in the boiler.

It will be noticed that a branch pipe connects the pipe, L^2, with the cock, X^1, on the lubricating tank, X, and it should also be mentioned that the pressure tank, L, is provided with a stop-cock, L^3, connected with a nipple, by means of which any air in the tank which may have been absorbed by the water can be replaced.

The pipe, T^1, which leads from the bottom of the condenser, T, up through the water to the top of the supply tank, G, may be regarded as another part of the water system. The condensed water is forced up by the pressure of the exhaust steam, and it comes out on the top of the feed-water. Any oil that may be present in it floats on the top, and is not only unable to find its way down to the pumps through the feed-cooler, G^1, but will flow out through the overflow pipe, G^4, before any water does so, when the tank, G, is refilled.

The Steam Connections.

The steam generated in the boiler, P, is conducted through the pipe, Q, to the safety valve fitting, R, from which a pipe, R^1, leads to pressure gauge, R^2, and a blow-off pipe, R^3, passes. The pipe, Q^1, encloses that portion of the steam pipe, Q, which is allowed to expand and contract, and which in so doing operates the automatic valve, E, through the connecting links, Q^2. The steam passes from the safety valve, R, to the throttle valve, S, and from it through the pipes, S^2, to the steam chests, U^4, of the engine. The throttle valve is controlled from the steering pillar, as already described. In practice the speed of the car is almost entirely controlled by the driver by means of the throttle. The exhaust steam from the engine is led by the pipes, S^3, to the condenser, T, where it is for the most part reconverted into water.

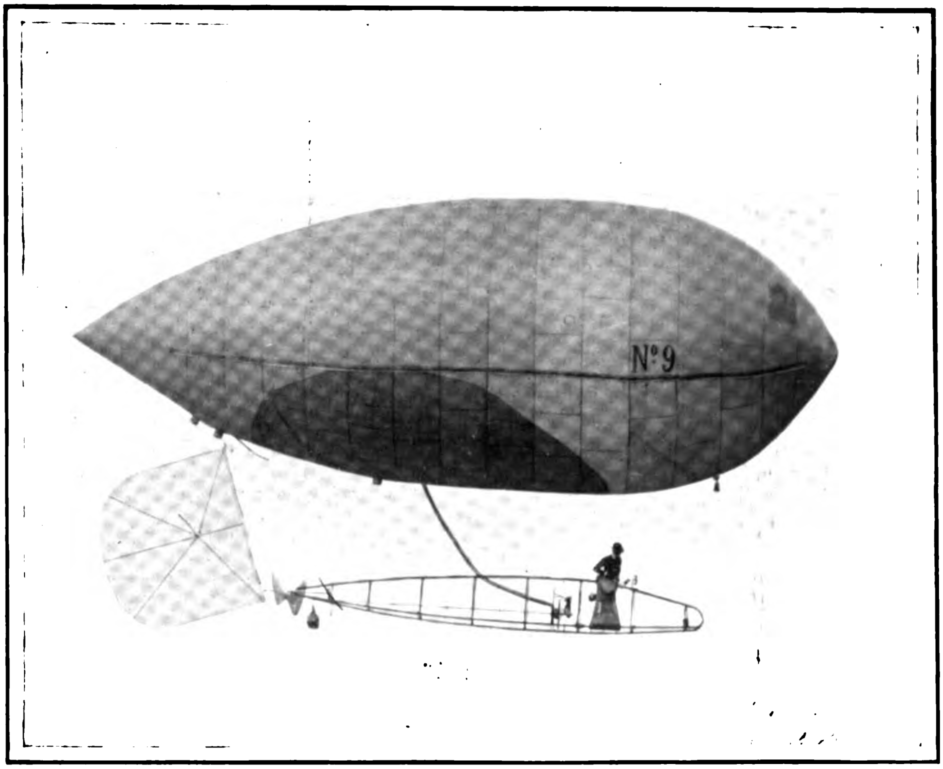
The Lubricating System.

The majority of the moving parts in the car run in oil, and do not, therefore, require other means for feeding them with oil. The slide valves and the pistons, however, have to be lubricated in a special manner, and the oil has to be fed to them at about the same pressure as the steam. The peculiarity of the system adopted for doing this is that the oil which is fed into the steam chests arrives there cold, and this is claimed to be a considerable advantage. The main supply is carried in the pressure tank, X, into the bottom of which the branch pipe from the water-feed pipe, L^2, is led through the cock, X^1. The water is in this way forced into the tank, X, and, since the oil floats upon its surface, the oil is forced out at the top through the pipe, X^3, to the sight-feed lubricator, X^4. The actual pressure in the lubricating system is, therefore, the same as that in the water system, which, as we have already seen, is practically the same as in the boiler. Since the steam pressure in the steam chests is lower than that in the boiler—especially when the throttle valve, S, is not fully opened—it follows that the lubricating oil can flow from the fitting, X^4, on the dashboard through the pipes, X^5, into the steam chests. The lubricator, X^4, is so made that its sight-feed glasses can be filled up with water so as to form an incompressible medium and to allow the drops of oil passing up through it to be seen. The actual rate of feed can be varied to each cylinder independently by needle-valves provided for that purpose. These needle-valves must be closed when the engine is not working, as otherwise the oil would flow too rapidly when the throttle-valve, S, is shut; the engine is usually kept running even when the car is at rest. As soon as the oil contained in the chamber, X, has all been displaced by the water, it is then necessary: (1) to close the cock, X^1; (2) to drain out the water through the cock, X^2; and (3) to refill the tank.

ANOTHER WONDER BATTERY.

The electric vehicle would be such a lovely means of progression if the motors with which it is furnished could run or be supplied with current without the encumbering weight of the battery which is at present necessary, or even if the weight of the battery could be seriously reduced, that the one desire of all those interested in electro-mobilism, and perhaps many others, is that at the earliest possible moment an ideal battery may be invented, or, at least, a battery which if not ideal, at any rate largely economises the weight involved, that hardly a month passes without the announcement in the Press of some astonishing improvement in accumulators. The worst of these wonderful batteries is that they never appear to get further than the columns of the newspapers, or, at the very most, the glass cases in which they are exposed to the view, but protected from the examination of the vulgar. The latest revolution (on paper) in battery development is attributed by the *Western Electrician* of Chicago to a certain Mr. Gardner, who has produced a battery, of course of the alkaline type, which is stated to give 100 ampere hours at 1·4 volts per cell, the cell weighing something less than 6 lbs. This is somewhat over 17 watt hours per pound of cell, a result which is higher, though, after all, only somewhat higher, than has been obtained with the lightest lead batteries, though from other data furnished, perhaps this figure would appear to be too high, as the average voltage of the discharge is said to be 1·25. Of course, the announcement is accompanied by the usual statements about non-disintegration of the materials, rapidity of charge, and all the rest, but these statements must always be taken with a large grain of salt, as, after all, with the worst lead battery, it usually takes six months to find it out. The inventor of a storage battery who could keep silent for six months until he had really tested his battery satisfactorily would probably be a greater curiosity than the battery he had invented.

AERIAL PROGRESS.



Santos Dumont Airship No. 9, in which M. Dumont last week made his successful evolutions in the Bois de Boulogne, Paris.

FRENCH aeronauts had quite a field day last week. Both M. Santos Dumont, with his No. 9, of which we reproduce a photograph, and the MM. Lebaudy's navigable balloon, took the air. Previous experiments have been made with the Lebaudy airship on short distances, which we have chronicled from time to time. On Friday last, however, it made its first really extended flight, and a record performance it was. It started from the shed at Moisson, and proceeded to the town of Mantes. On arrival there it circled round the town, and performed some evolutions about and in between the lofty towers of the Cathedral. It then returned to Moisson against a considerable head wind, and arrived at its mooring place in front of its shed without the slightest mishap. The manœuvring of the machine was throughout most satisfactory, its stability was, as far as could be seen, perfect, and the manner in which it answered the helm left nothing to be desired. The test was a severe one, as it was raining practically all the time, and in addition the wind was against it on the return journey. The total distance covered was 37 kiloms., and it maintained a speed during a great part of its flight of upwards of 20 miles an hour. Altogether this was the most satisfactory airship journey that has yet been accomplished. An additional ground for congratulating Messrs. Lebaudy, is the fact that their airship was of very practical proportions, and is capable of transporting two passengers with ease. On the flight to which we refer, it carried the engineer, M. Juchmes, and the mechanic, Rey, who had charge of the motor, together with 120 kilogs. of ballast. The effect of the rain was so considerable as to add a weight of 90 kilogs. to the whole airship. The whole time taken in accomplishing the 37 kiloms. was 1 hr. 37 m. Thus not only has the Lebaudy airship established a record for distance covered to and from certain points, but it has shown that a suitably constructed airship of the kind can maintain itself for a considerable length of time in the air.

The Lebaudy airship is of ample proportions, the balloon proper being constructed of two thicknesses of cotton enclosing a film of indiarubber. Its length is 56½ metres, sharply pointed at either end, and its total content is 2,284 cubic metres. As is becoming very general in designs of the kind, the balloon contains a compensating balloonette, which is kept full of air by a centrifugal fan. The motor, which drives a pair of 2·8 m. propellers, is a 40-h.p. 4-cylinder Mercedes; it runs normally at 1,000 revs. per minute. The superficial surface of the rudder is 10·2 square metres. The car accommodating the motor and the aeronauts is not nearly so long as in the Santos-Dumont machines, being only 4 metres in length, 1·60 metres wide, and 80 centimetres deep. The shape of the balloon proper is to some extent pointed downwards, so that the car with its suspension forms the apex of an inverted rough cone. It is suspended from a platform underneath the balloon proper by 24 steel cables, varying in thickness from 5 to 6 mm. The total weight carried, including the passengers, ballast, motor, and water and petrol enough to supply the latter for 15 hours, is 1,800 kilogs.

On the same afternoon Mr. Santos Dumont also gave his No. 9 an airing. His object, apparently, was not so much to do a long distance record as to test and give demonstrations of the great controllability of his latest model. He circled about above the Bois de Boulogne like a swallow, where and how he chose. On one of his descents he was hailed by a park-keeper, no doubt in a comic vein, and asked if he had a permit to invade the Bois in such a manner. "No," he replied, "where do you get them?" and was referred to the address of the chief Verderer. He immediately rose in the air and sailed off in the direction indicated. On enquiry as to what formalities were to be fulfilled, he was told there was no objection to his sailing about, and for the third time he again rose and continued his evolutions. On approaching the gate at the entrance to the Bois, M. Dumont again descended to within 20 feet of the Octroi and declared that he was carrying two gallons of petrol. "All right," shouted the official, "we won't detain you," and again the air-ship rose and continued its flight, finally returning with perfect safety to its shed. A better demonstration of controllability could hardly be asked for. An average speed of about twelve miles an hour was maintained throughout the evolutions. Of course, Santos-Dumont No. 9, which is much smaller than its predecessors, is not intended for high speed. It is essentially designed for practising evolutions and familiarising the aeronaut with management. Its general design, as our readers will see from the illustration, is similar to the earlier Dumont air-ships, but not only is the balloon proper much smaller, but the Clement 2-cylinder motor which supplies its propelling power develops only 3 h.p. In fact it is practically a bicycle motor, driving the propeller direct through a clutch. A bicycle wheel, the rim of which has been weighted, serves as a flywheel, and the ignition is by means of accumulators and an induction coil. The propeller shaft is carried in three bearings, 1½ metres apart. The motor is placed at the back of the car.

The Stanley air-ship, which is being built for the St. Louis Exhibition, is a very enormous affair, and it is estimated that when completed and inflated it will have a lifting power of 13,000 pounds. The propellers, of which there will be two, one forward and one aft, will be 10 feet in diameter, and driven at a speed of 800 revs. per minute. The whole structure is of light girder type, conical at either end, the conically-ended cylindered skeleton enclosing six separate gas bags, which will be inflated with hydrogen. The bottom part of the skeleton forms the car containing the motor, and, in addition to the propellers, which are mounted at the apices of the two cones, there are rudders fore and aft, and two propellers on top to be employed to assist rising and descending. Lateral aeroplanes, somewhat on Dr. Barton's principle, are to be employed for facilitating manœuvring. The length of the whole is to be 228 feet, and the diameter of the cylindrical portion 56 feet.

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J. BRISBANE WALKER, of New York, giving evidence before the New York Commissioners, considers that an underground rapid transit system, to relieve the congested street traffic, is about as modern as a flint-lock musket. He proposes a steam omnibus service, which he states could handle the entire business traffic of New York City on an investment of 10 million dollars, against 300 million dollars of stock of other means of transit. 50,000 passengers could be transported by steam omnibuses in one "rush" hour against 23,000 by the existing electric cars.

MECHANICAL ROAD CARRIAGES.*

BY W. WORBY BEAUMONT, M.I.C.E.

IN continuing these lectures and following the syllabus, Mr. Beaumont opened the second of the series by first referring to the position of the industry in this country, in France, Germany, and Belgium, in 1897. He considered that English makers should have at first gone on the lines adopted by Continental makers, instead of which they had commenced to make entirely different vehicles. The motors made by the Daimler Company (at Cannstatt), Panhard Levassor and M. M. Peugeot, and the gear design generally used by these makers, continued for a long time to be very satisfactory. English makers, however, had since then made good use of French and German experience, and had moreover produced, in two or three cases, vehicles which, although differing in almost every essential from those of Europe, were amongst the best vehicles made.

He next referred to the establishment of the Automobile Club, an organising body which had done a very great deal to place the British industry in the leading position it now occupied. He went on to point out the practical character and usefulness of the Club trials, as compared with the French races, for discovering the best lines upon which motor construction should be based. He showed upon the screen, amongst other vehicles, early French, German, and Belgian cars, and the 1898 and 1899 Daimler cars made in England. Credit was in particular given to Daimler, Benz, Levassor, and Edward Butler for their active originality, and to them he said a great debt of gratitude was due.

Mr. Beaumont next dealt with heavy vehicles, and the trials carried out in France in 1899. Regarding the raising of the tare limit, he thought it was a mistake, as this would involve such high power and wide wheels that they would become modified traction engines, and the necessary reduction of speed would prevent them being run on a profitable basis as compared with those of lighter construction. With regard to a motor omnibus service, he thought that even now satisfactory vehicles could be obtained, but that omnibus companies must be as considerate of their cars as the railway companies were of their locomotives, allowing plenty of margin for overhauling and repairs; they should provide an ample inspecting and maintenance staff in their sheds and workshops.

In delivering the third lecture, on May 11th, Mr. Beaumont first gave brief descriptions of several of the different types of cars made in 1900, 1901, and 1902, pointing out the various improvements in mechanical details which had been made during that period. He also remarked upon the increasing popularity of the internal combustion or petrol motor, particularly for all the long-distance trials and races; he also spoke of the success which had been attained with steam vehicles, especially in regard to the generators. The object and construction of the carburettor in many forms was dealt with in detail, a large number of diagrams being shown on the screen. The lecturer went fully into the constructional details of the early forms both of surface and float-feed spray-making carburettors of English design, also pointing out the various forms which have since been generally adopted, several of them being so designed that the required quality of carburetted mixture was automatically maintained under the varying conditions of speed and throttling, such as those of Butler, Maybach, Bradley, Pidgeon, and Krebs. Full descriptions were given of these devices by Mr. Beaumont. He then referred to the vaporisers used for heavier oils, also to the alcohol carburettor, and to the latent heat of evaporation of alcohol as compared with that of petrol, which made it necessary to proceed on somewhat different lines to those adopted with the petrol carburettor.

Tyres and the tyre trials carried out last year by the Automobile Club next received attention, Mr. Beaumont's remarks being supplemented by an exhibition of examples of tyre construction by the Dunlop Company and the Collier Company, the latter company showing two wheels shod with Collier tyres which had been used in last year's trials, and had run 4,000 miles. During the concluding portion of the lecture some views were shown of the Napier Gordon-Bennett car, also a view of the 50-h.p. Wolseley racer owned by Lieut. Mansfield Smith-Cumming.

Mr. Beaumont's lecture, although lasting an hour and a half, had far from exhausted his notes for that evening's discourse, and it would be necessary, he said, to leave many matters to be dealt with at the next meeting.

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A POLICE trap in Sutton is reported. The constables are stationed at the top of the hill, and have a cord ready to stop cars at the crest after coming down the incline.

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*Second and Third Society of Arts Cantor Lectures.

PATENTS FROM THE MANUFACTURERS' POINT OF VIEW.

(*Continued from page* 486.)

THE steps that have to be taken between the issue of a writ and the actual hearing of the case are numerous and often complicated. It is not too much to say that the general public is quite unacquainted with their nature or even with their existence. They are often of considerable importance in deciding the ultimate result of the action, but in general may be left more exclusively to the barristers employed than the preliminary consultations should be, as they are of a more purely legal nature than the latter. Nevertheless, technical assistance is advisable at the different stages and should always be at hand. This will be apparent when we have sketched out what the successive proceedings are.

In the first instance the writ must be issued and duly served. In addition it must be endorsed with the claim and a statement of claim. The claim must state what the plaintiff is proceeding for, whether an injunction, damages, account of profits, delivering up the infringing article, costs, or all of these.

The statement of claim must set forth the leading features of such a case as will, if established, justify the Court in granting the relief asked for, and must be accompanied by particulars of breaches. These must clearly show both the nature of the infringement alleged, the occasions on which they have taken place, and that they have been committed by the defendant. Considerable legal experience is required for the correct framing of claims and particulars of breaches, but adequate technical knowledge and supervision of what is being done is also highly important.

After the delivery of the statement of claim and the particulars of breaches, a certain time is allowed the defendant to furnish his defence and particulars of objections. The defence usually takes the form of a declaration to the effect that the statement of claim is false in all its particulars. It denies, as a rule, infringement, and denies the validity of the patent—its utility and its novelty; and sometimes the statement is added that the patentee was not the true and first inventor, though, unless special evidence can be produced in support of this, there is not much object in introducing it.

The particulars of objections set out in a more elaborate form the above general objections to the patent, together with descriptions of all the published documents in which alleged anticipations of the invention are contained, such descriptions as come close to it. These usually include not only Patent Specifications but articles in technical publications, whether journals or treatises. The particulars of objections should also state any alleged occasions on which the invention was practised in this country prior to the date of the patent, and if it is maintained that the invention was previously published to individuals the individuals should be mentioned and the occasion on which the publication occurred.

If the plaintiff does not find the particulars as clear as they might be he can apply to the Master of the Court for an order for further and better particulars. On the other hand, if the defendant finds out something further against the patent he can apply to amend his particulars so as to insert the new objection that he has discovered. This permission is only granted under a Discontinuance Order, which means that the plaintiff has the right to withdraw from the action if he finds the new particulars are likely to be fatal to him, the defendant paying the costs occasioned by his application to amend.

Sometimes in patent actions, as in other cases, interrogatories are administered. These consist of a sort of cross-examination in writing delivered to the defendant, designed to elicit information about his methods of procedure, and they have also to be replied to in writing. They are not very usually resorted to in patent actions, as they tend to disclose to rather too large an extent the lines that those conducting the case propose to take.

Orders for inspection, however, that is for the plaintiff to see the defendant's method of working so as to enable his witnesses to say in what extent he may be infringing are common. Most of these applications have to be supported by affidavits, and are made in the first instance to the Master of the Court. From his decision, if either of the litigants are dissatisfied with it, the appeal lies to the Judge.

In all these matters the legal experience of counsel frequently requires supplementing by the technical knowledge which should be supplied by the patentee himself or the expert in charge of the case. Technical mistakes in the pleadings (the claim or defence alluded to above) or in the interrogatories may have serious results. An instance will show this forcibly. In a recent case dealing with an electrical patent, one of the counsel engaged in framing an interrogatory made use of the expression "high resistance" in reference to an electrical transformer, when he should have used the term "high tension." An important element in the plaintiff's case consisted in showing that the transformers in question were adapted for high tension purposes but had really low resistance. The incorrect employment of the term "high resistance" was made great play with by counsel for the defence to the great disadvantage of the plaintiff's case. A mistake of this kind ought not to have occurred if a technical expert had exercised proper supervision over the preliminaries to the trial.

There are often many documents having an important bearing on a case which it may be greatly to the interest of one side or the other to obtain possession of before the trial comes on for hearing. It is equally to the disadvantage of the other side that they should be produced, and there is sometimes, in consequence, a very interesting skirmish before the Master, and on appeal from him before the Judge in Chambers, in regard to their production. The successful prosecution of these proceedings may therefore be of the highest importance. An episode of the kind occurred in the Maybach Carburettor case, which we dealt with at considerable length in THE AUTOMOTOR JOURNAL for August, 1901, Vol. V., p. 536. In this case there had been a previous trial, the evidence given in which by the witnesses was of considerable importance in the defence of the case, though it was not altogether to the credit of certain parties. It proved to be of great value in the cross-examination of the witnesses for the plaintiff, and enabled the defence to show that their evidence in the two cases was contradictory. There was only one copy of the shorthand report of the evidence in the previous trial available. The plaintiffs adopted every possible manœuvre to prevent the defence obtaining possession of it. It was only after a very tough fight before the Master and the Judge that it was delivered up. On the adequate conduct of these preliminary portions of a case a great deal therefore may depend.

(*To be continued.*)

THE GORDON-BENNETT RACE AND IRISH FORTNIGHT.

THE Cup racing cars will be weighed at Naas.

MR. MARK MAYHEW will drive the pilot car on the day of the race.

THE course for the motor boat race in Cork Harbour will be about ten nautical miles between Aghada Pier and Tivoli Bridge.

MR. ROBERT E. PHILLIPS will have the entire management of the timing arrangements for the race and other events of the Irish Fortnight.

ON the day before the Cup race members of the Races Committee will drive over the course, so that those in charge of controls, &c., may fully understand their duties on the day of the race.

A RAY of hope that the King may witness the race is forthcoming in the announcement made that His Majesty cannot yet decide whether he will be able to visit Ireland in July or August.

THE Kilcullen Hotel has been taken by Mr. C. Arthur Pearson, of the *Daily Express*, for the race week, where he will entertain his friends. Kilcullen is only about four miles from the start, and is one of the chief points on the course.

THE Cork Exhibition motor events arranged for are a three-mile race and a hill climb. The former will be run from Wellington Bridge to Carrigrohane, and the latter on Marlborough Hill.

LAST Saturday, M. Jenatzy and Herr Hieronymus were elected members of the German Automobile Club, *one* difficulty thereby being removed in connection with the nomination by Herr Jellineck of drivers for the Mercedes cars. At present the committee refuse to accept Werner as a member, even at the risk of the Club having to "scratch" for the race. Possibly Herr Jellenick, now Hieronymus is qualified to drive, in addition to Baron de Caters, his other nominee, may meet the Club and select the third driver from such intrepid drivers as Baron de Forest, M. Degrais, or M. Jenatzy.

THE MAN IN THE STREET (Chris. Healy), in this week's *To-Day*, lets himself go in the following humorous vein on the race. Under the guise of fun, Mr. Healy manages to bring in a considerable amount of sound philosophy :—

"I see thet the're gowin' ter hev a motor-rice in Ireland. 'Ow's it thet they down't hev it over 'ere? Seems ter me," said Mr. 'Iggins, "thet Ireland ain't the ownly plice on the plenet."

"The great motor-race will be held in Ireland," returned Mr. Magan, "bekase motor-dhrivers an' Irishmin have a sthrong bond av union an' sympathy—the' both hate the police. In England ivry man, unliss he's a difindint, or afraid av becomin' wan, rispicts the law, an' loves the magisthrates, ispishully whin, like me isteemed frind Mr. Plowden, the' are fond av a joke. But in Ireland ivry man, unliss his brain is afflictid, hates the law an' all its wor'rks. The prisint Governmint, as yo' know, is afraid av its frinds, an' have flown fer protiction to its inimies, the Irish mimbers, an', as a small mar'rk av gratichude, the've given their consint to a thing that the' couldn't stop, an' that's the motor-kyar race bein' run in Ireland. The risults will be wor'rld shakin'. To begin wid, it'll show English motor-car proprietors—all iv thim, Conser'rvatives or Liberal Unionists—that the Irish are a superior race, wor'rth knowin' an' bein' frinds wid, an' the'll ~~thrill wid~~ ginirous plizhure whin the' find that the Irish authorities have commandid the police to keep the road, an' arrist ivry pidisthrian that gets in the way av a motor-kyar, a thing the' couldn't ixpict in their own counthry, unliss a rivolushun tuk place. 'Twill make ivry motor-dhriver weep whin he thinks av Surrey an' its dir'rty, mane magisthrates. Thin, again, 'Iggins, the race in Ireland will stop the jibin' av the Frinch Press, fer in Parus the police are on a livil wid their Waterbur'ry watch *confrères* av Surrey. The Ger'rmans will rigrit that the Kaiser prefers to ride a hor'rse, an' will stir him up into abolishin' his cavalry an' replacin' thim be a motor-corps; whilst the Irish race will be paralysed be th' unusual spicticle av money flowin' into Ireland instid av out av ut, to say nothin' av their astonishmint in seein' the Union Jack fer the fir'rst time in their lives. The whole island will stop wor'rk that day in or'rdher to ar'rn a little money be scattherin' chickens, an' pigs, an' dogs widout pidigrees in convanient places, where the'll be wor'rth more dead than alive. 'Twill be a great day fer Ireland."

"It sounds a bit of all right," admitted Mr. 'Iggins.

"'Twill show more than iver that Ireland is like South Africa, a land av sur'rprises. It may astonish ye to know that whilst ivry Irishman is a ribil in theory, he's an Imperyulist in practice. Since the Act av Union the British Impire has bin carried on the shoulthers av an Irishman. In them days 'twas the Juke av Wellington an' Bill Beresfor'rd, an' now 'tis Lor'rd Char-les Beresfor'rd, an' Kitchener, the man from Kerry. Since the days av Marlborough the English have bin unable to breed a soldier. The rayson is that at that time the Bank av England wuz invinted, an' since thin the genius av England has devotid itsilf to the raisin' av Hooleys' an' race-hor'rses. Now, whin the English motor-kyar min go to Ireland the'll be sthruck wid these an' other facts. The'll see that the rayson why Irishmin make great soldiers an' ginirals on furrin battle-fields is bekase the' are not afraid to face the police at home. An' the'll be convinced that whin an Irishman has med up his mind on anny subjict he's invariably right. The rigulashuns av the race intitlin' the runners to kill a policeman iv nicissary, will be ample proof. The recor'rds av the race, like ivrythin' ilse produced in Ireland, will be astonishin'. Consequintly, the English motor-min will come back to London swearin' that the granjer av our Imperyul race will pass away unliss the British Parlymint is moved to Dublin at wance."

"Tike our Parlyment to Dublin!" exclaimed Mr. 'Iggins, indignantly. "Not arf."

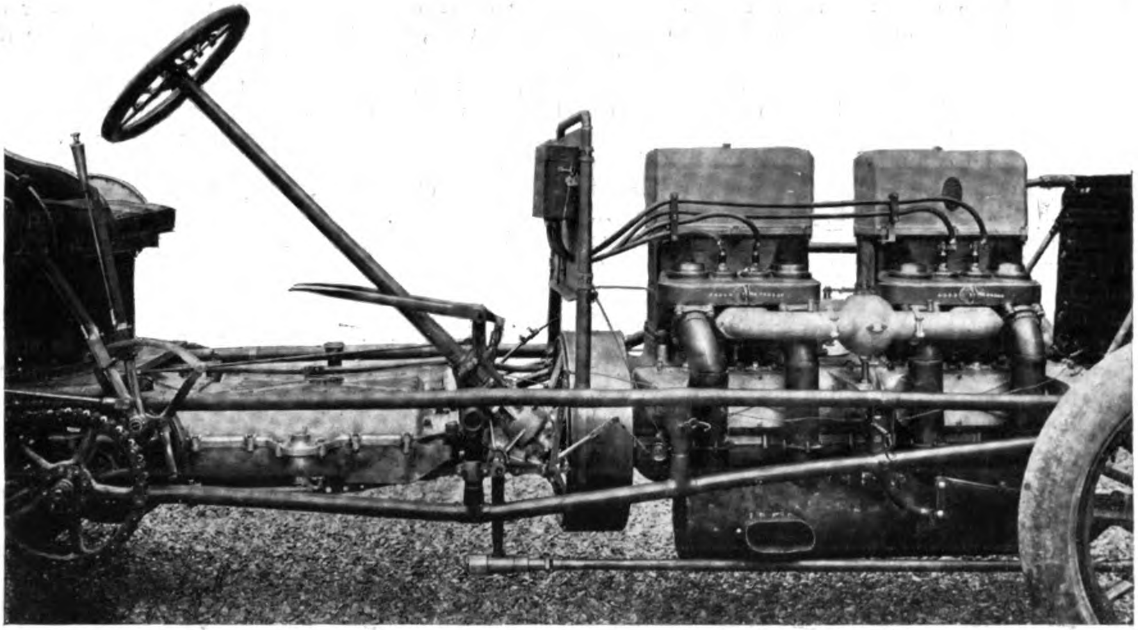
"Niver mind," said Mr. Magan, consolingly, "iv an Englishman proposes ut Irishmin will fight the idaya wid tooth an' nail. An' the'll win their point, too, as the' always do; but afther a long time, an' undher another name."

PARIS-MADRID.

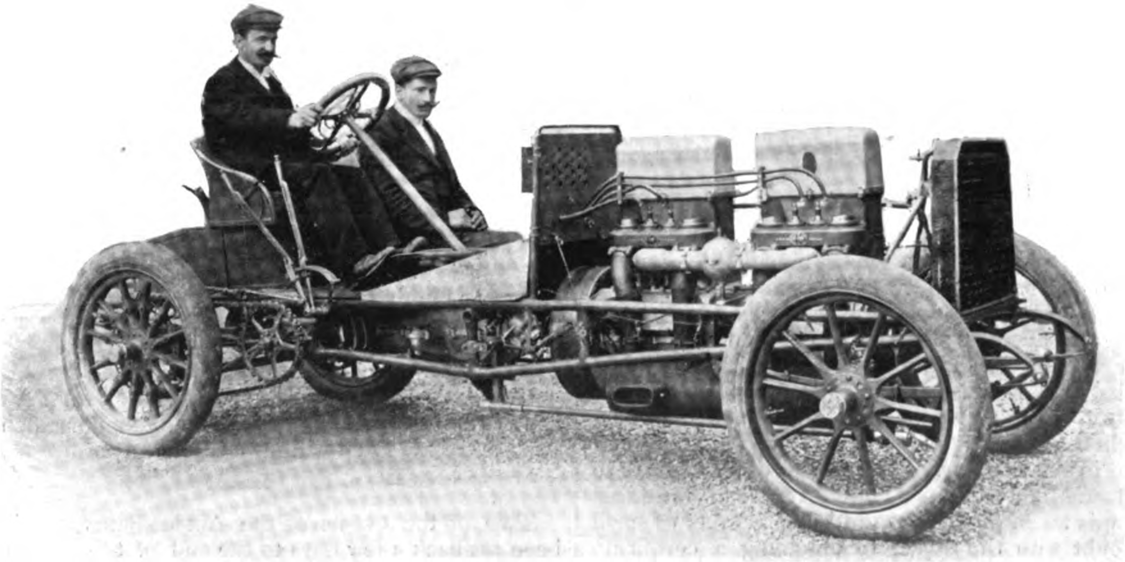
MUCH more satisfactory accounts have now been received of the state of the roads for this event, particularly over the Spanish portion of the route. M. Georges Prades, of *L'Auto*, who has covered the entire road from Paris to Madrid in three days, accompanied by MM. Henri and Maurice Fournier, speaks very highly of the great improvement which has been brought about in the surface within the last few weeks, due very largely to the interest which the Duke of Santo Mauro, the President of the Spanish Automobile Club, has awakened in the road authorities. Several stretches of road, where until recently it would have been positively dangerous for cars to have travelled at anything like high speed, are now reported as being in perfect order.

Sixty-one tourist vehicles were entered for the start on Thursday, including both the Baron and the Baroness de Zuylen, who will each drive separate cars—the former his six-seated Panhard, the latter, a 28-h.p. Mercedes. Forty-five actually started, the Baron and Baroness waiting until the second day. Mme. Lockert was a starter with a 12-h.p. Ader, and Mme. Clarke with a 24-h.p. Renault.

The racing section will not start until the morning of Sunday, the 24th instant, when it has been finally decided to dispatch the cars at intervals of one minute each, the motor cycles being sent off in pairs. For the first stage, from Versailles to Bordeaux (552 kiloms.), a maximum time of twenty-four hours will be allowed for completion. Four days will be occupied by the officials previous to



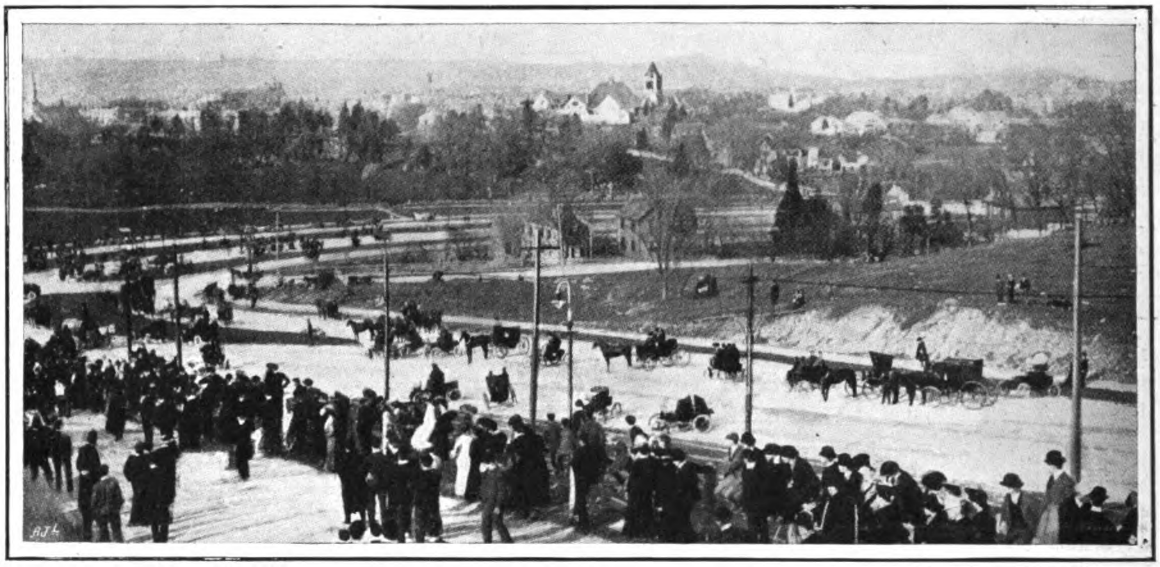
Portion of the first Paris-Madrid 120-h.p. Gobron-Brillie Racing Chassis, showing engine, main clutch, gear box, and operating levers and pedals in position. The cylinders are cast in pairs, and each cylinder contains two pistons which reciprocate in opposite directions to one another, and drive the crank-shaft beneath them. The inlet valves, as well as the exhaust valves, are mechanically operated, all eight cams being mounted on one cam-shaft. High tension ignition plugs are fitted in the inspection covers above the inlet valves.



The first Paris-Madrid 120-h.p. Gobron Brillie Racing Car, fitted with 4-cylinder motor and honeycomb radiator. The construction of the tubular frame is particularly noticeable; the framework round the dash is also built of tubes. M. Rigolly, who will drive one of these cars in the Paris-Madrid event, is seated at the steering wheel.

commencing to weigh up the cars, obtaining particulars of each vehicle, and conforming with the required formalities in respect to Customs duties, &c. For this purpose May 19th is allotted to cars numbered from 1 to 75, the 20th for cars from 76 to 150, the 21st for cars from 151 to 225, and the 22nd from 226 up to 300. No replenishing of petrol will be allowed in the Spanish towns, as it is contrary to the laws of the country, and everything in this respect will have to be completed beyond the outskirts of the towns. There are about ten portions neutralised in Spain on account of the population, but there are several villages on the last stage which are necessarily neutralised (seven in all), as the roadways through these are so ill-kept that it would be positively dangerous to the cars to permit them to attempt to travel at anything but the slowest speed in passing through these short stretches.

The French Minister of Agriculture has given a prize to be awarded to the fastest car which gets through, using alcohol for fuel.



Boston Hill Climb.—General view of Commonwealth Avenue Hill, where the Competition took place. From the *Horseless Age*.

A HILL-CLIMBING Contest, arranged by the Massachusetts Automobile Club, was held on the Boston Commonwealth Avenue on April 20th, when the remarkable climbing capabilities of a small steam car over a short distance were demonstrated. The hill selected measured one-fifth of a mile, giving an average grade of 13 per cent. The best time was made by F. Durbin on a 5½-h.p. Stanley steam car, on a first trial, in 17 secs., and on a final trial in ⅖ of a second better. The test generally, however, was not controlled with the amount of strictness to which we are accustomed in this country, as the weight of passengers to be carried was not specified, and in several instances advantage was taken of this to crowd in a number of small boys, no doubt with the object of obtaining a certificate that so many "passengers" were carried. The crowd, which was very large, considerably interfered with the competitors getting the best out of their vehicles, and at the "grand final" run, when all the winners in the various classes were to run against each other, after the Stanley runabout had passed up the hill first in 16⅗ secs., giving a speed of about 40 miles an hour, the spectators closed in, completely blocking the roadway, and preventing any of the other competitors from running off their final heat. They were, therefore, content to stand by the times they had made respectively in their classes, these being as follows: 1¾-h.p. Warwick motor bicycle, 28 secs.; 5-h.p. Stevens Duryea (cars under 2,000 lbs.), 43⅕ secs.; 16-h.p. Peerless (cars over 2,000 lbs.), 43⅖ secs.; the same, fitted with tonneau body, 16-h.p. Peerless, 51⅘ secs.; 3-h.p. Waverley electric car, 1 min. 16⅗ secs.

The longest time taken by any petrol car was 1 min. 56⅕ secs., and by electrics 2 mins. 35⅗ secs.

G. C. CANNON, of Harvard University, is stated to be building a new 50-h.p. steam car with a maximum speed of 85 miles per hour. The body is to be of aluminium and the total weight of the vehicle 1,300 lbs.

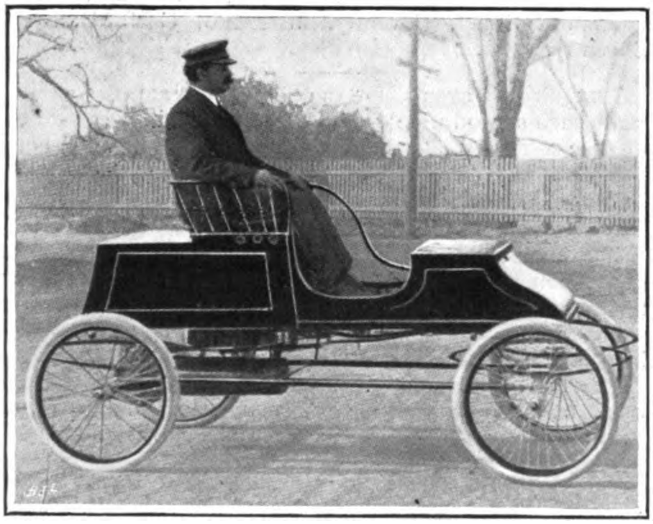
THE Nice Week for 1904 will be from March 20th to 28th.

A HILL climb for June 1st on the Paris road is announced by the Dordogne Automobile Club.

OLDFIELD AND WRIDGWAY are reported from America to have arranged for May 30 an automobile match on the Empire track. Each will have three runs of five miles each.

Two of the events of the Aix-les-Bains fortnight have been set back a few days to the end of the programme, in order to partially overcome the clashing of dates which has arisen with the Circuit des Ardennes. The Rhone Club have now fixed the speed kilometre for June 26, and the speed road race for June 27. This will enable competitors in the Ardennes race to get to Aix in time for both these events.

The National Belgian Circuit.—Forty cars started for this Tourist event from Brussels for Antwerp (63 kiloms.), the first stage of the journey, on the 9th instant, the second stage, on the 10th, being Liège (34 kiloms.), on the 11th, Arlon (125 kiloms.), 12th, Namur (146 kiloms.). The 13th was devoted to a hill-climb and a kilometre speed course at Namur and a series of brake tests, the final journey being back to Brussels (96 kiloms.) on the 14th. We published all the necessary details of the rules governing this trial in our issue of April 25th, on page 434, and the results, based upon the points taken into consideration by the judges, we shall announce next week. The A.C. of Belgium have made the daily runs as far as possible to represent the work of an ordinary day's run for a tourist, at Antwerp and other points ample time being given for sightseeing and enjoyment by the competitors. Throughout the run at each stopping place the various local automobile clubs have accorded the competitors a special reception. By the number of cars which have, up to the time of going to press, in spite of the bad weather experienced, successfully completed the various stages, the object of the run, which is practically a "selling" trial, should be attained and bring forward some very substantial results to those manufacturers who have supported the Club in the competition.



The Stanley Steam Car which covered ⅛ of a mile on the Boston Commonwealth Avenue Hill at the rate of 40 miles per hour.

Scottish Automobile Club.—107 Miles Periodical Non-stop Trial.—The official results in the first of these trials, which took place on April 21st, and which was duly dealt with by us at the time, are now announced. Upon the occasion the weather was bright, but the road was soft and loose at parts, a large part being made up with loose gravel from the sea shore. The trial included Whistlefield Hill up to Garelochead, 4,545 ft. = ·86 of a mile, total rise 293 ft., average gradient 1 in 15·5, including 290 feet of 1 in 7·8, and 387 ft. of 1 in 8·5.

Three **Arrol-Johnston** cars were entered by the Mo-Car Syndicate, Ltd., of Paisley, with the following results:—

No. 1.—12 b.h.p. 4-seated dog-cart, fitted with two cylinders, Clarkson and Capel cooling tubes, magneto ignition. Weight, with water and fuel, 25 cwt. 2 qrs.; with four passengers, 31 cwt. 1 qr.; petrol used, 6¼ gallons. Non-stop run and speed up to legal limit throughout. Time for the hill, 7 min. 7 secs. Brake tests on two tests on up grade, car held instantly; on two tests on down grade, within three yards of application of brake. Band brake on differential shaft alone used on all tests.

No. 2.—12-b.h.p. 6-seated carriage, fitted with two cylinders, C. and C. cooling tubes, magneto ignition. Weight with water and fuel 27 cwt., with six passengers 35 cwt. Petrol used 7½ gallons. Speed up to legal limit. Stopped twice during hill climb, viz., once 10 mins. 12 secs. just as three passengers dismounted, and one momentary stoppage of wheels in changing gear. Hill time, including these stoppages, 17 mins. 2 secs. Brake tests, efficient either forward or reverse.

No. 3.—12-b.h.p. 4-seated dogcart, fitted same as No. 1. Weight with water and fuel 24 cwt. 2 qrs., with four passengers 30 cwt. 2 qrs. Petrol used 6⅜ gallons, non-stop run, speed up to legal limit. Hill time 8 mins. 8 secs. Brake tests efficient either forward or reverse.

Motor Cycle Track Records.—At the Canning Town track on Saturday last, G. A. Barnes, in an attempt on the one hour standing-start record, which, owing to the rain, he had to abandon, beat all previous records from 1 to 27 miles. His time for the 27 miles was better by 4 mins. 32⅜ secs. than F. W. Chase's record—in the half-hour Barnes covered 25 miles 690 yards. The following are some of the new times established: 1 mile, 1 min. 24⅜ secs.; 5 miles, 6 mins. 7 secs; 10 miles, 11 mins. 53⅛ secs.; 20 miles, 23 mins. 40 secs.; 25 miles, 29 mins. 33 secs.; 27 miles, 31 mins. 55 secs.

IT is curious that in the United States, as in England, the agitation in connection with the speed restrictions for automobiles has just now reached a very acute stage. But fortunately in England we are much more happily placed in not having a number of States all making different rules and regulations for their particular district. One humorous illustration in an American contemporary attempts to give some idea of what state of things this multiplication of laws may result in, and depicts a car with a huge lamp in front almost entirely eclipsing the car itself, on which are painted the registered numbers of the car in the various States, and in like manner the absurdity of this state of things is shown at the back of the car by a servant being employed in revolving on an adjustable roller the numbers pertaining to each State as the passing from one district to another necessitates their being shown. No doubt, in time, something will be done by the Supreme Legislature to overcome the absurdity of this position but in the meantime the various enactments being placed upon the statute are bringing about a very confusing and irritating state of affairs. A specially keen attack has been made by automobilists upon a Bill known as the Doughty-Bailey Bill, which has been provisionally accepted by the Albany legislature to control automobiles in New York State. This is a Bill which it appears has been tacitly approved by the President of the Automobile Club of America. Several of the clauses, however, are not to the taste of the members of the Club generally, and they have now very emphatically set forth their views to Governor Odell, and entirely repudiated the action of their President, Mr. A. R. Shattuck, calling upon the Governor to grant representative members of the club an interview, with the object of modifying several of the clauses before the law is finally passed. In its present state it is affirmed that the restrictions proposed to be enforced will practically close up automobiling in New York State. In addition a convention of representatives of all automobile clubs in this State has been called, with the purpose of organising a State Automobile Association, whose chief work, after watching the interests of automobilists generally for the district, will be to endeavour to make any law imposing special penalties on automobilists *as such* illegal and unconstitutional. By this means if a decision in favour of this contention can be obtained from the Supreme Court of the United States the varying and mixed-up legislation by the different States would be practically wiped out by one stroke. Possibly this may be the solution of the present impossible automobile position in the United States.

GLASGOW—LEEDS, LEEDS—LONDON NON-STOP TRIAL.

THIS important event, organised by the Scottish Automobile Club, began on Wednesday, when the cars were timed to start from Glasgow, commencing at 3.30 a.m., the distance to Leeds of 211⅞ miles having to be covered in a maximum time of 18 hours 10 minutes, to entitle to a certificate. At Leeds the cars were housed in Mr. Roland Wynn's garage, 30 Great George Street. The route was *via* Beattock, Carlisle, Shap, Kendal, and Skipton. The distance of 190¾ miles from Leeds to the Automobile Club-house, 119, Piccadilly, had to be covered on Thursday, the 14th inst., in a maximum time of 16½ hours. The cars travelled *via* Doncaster, Newark, Stamford, Biggleswade, and Hatfield. The following is a list of the entered cars and motor bicycles, with their official numbers. Those with ‡ did not start from Glasgow:—

Cars.

No.	Entrant.	Description.	B.H.P.	Approx. Weight Unladen.
				cwts.
1	Weston Motor Syndicate	14-h.p. Chenard-Walcker Tonneau	17	17½
2	Miss Dorothy E. Levitt	Gladiator	12	15½
3	Chas. Jarrott	24-h.p. De Dietrich ...	30	19½
4	Lanchester Engine Co., Ltd.	10-h.p. Lanchester	10*	19
5			10*	19
6	Rennie and Prosser, Ltd.	10-h.p. Wolseley Tonneau	10	19
7‡	Wm. H. Kingsbury ...	Darracq Tonneau ...	24	20
8	John Marston, Ltd. ...	4-cyl. Sunbeam Car	10–12	16
9			10–12	16
10	Hozier Engineering Co., Ltd.	Argyll	10	13
11	Middleton and Townsend	6-seated Phaeton (Gardner-Serpollet steam)	12†	32
12‡	J. R. Richardson and Co. (Lincoln), Ltd.	Tonneau Car	14	14
13	Frank F. Wellington, Ltd.	3-cyl. Brooke Tonneau	14	20
14	Henry B. Hemmons ...	Argyll	9	12
15	Captain H. H. P. Deasy	Rochet and Schneider ...	22	20
16‡	Delahaye Chief Depôt...	Delahaye Tonneau ...	12	16
17	Mann and Overton's, Ltd.	12-h.p. Georges Richard Light Car	13	13
18		24-h.p. ditto	26	16½
19	Mo-Car Syndicate, Ltd.	Arrol-Johnston Dogcart	12	24
20	J. W. Stocks	De Dion-Bouton ..	10	15
21	Mo-Car Syndicate, Ltd.	6-seated Arrol-Johnston Carriage	12	26
22	Thomas Shaw	10-h.p. Wolseley Tonneau	11	18½
23	Hozier Engineering Co., Ltd.	12-h.p. Argyll	16	17
24	Glasgow Motor Co. ...	Peugeot, 2-seated ...	6½	6½
25	Farman Automobile Co., Ltd.	F.A.C. Tonneau ..	24	20

* At normal revolutions, viz., 720. † Nominal.

Motor Bicycles.

No.	Entrant.	B.H.P.	Approx. Weight Unladen.	Rider's Armlet.
			lbs.	
1	Triumph Cycle Co., Ltd.	2¾	120	Scarlet.
2		2¾	120	Blue.
3	Quadrant Cycle Co., Ltd.	2½	130	White.
4‡	Weller Bros., Ltd.	2¼	95	Green.
5‡		2¼	85	Yellow.
6	Ariel Cycle Co., Ltd. ...	2	120	Pink.
7	Brown Bros., Ltd. ...	2¾	124	Scarlet and White.
8	Humber, Ltd. ...	2¾	156	Blue and White.
9		2¾	166	Red, White, and Blue.

Altogether 29 cars and motor bicycles started—22 cars and 7 bicycles. At the Leeds depôt the cars were retained wholly in the custody of the Club, no adjustment being permitted without deduction of marks. The first car to arrive at Leeds, at 3.40, was Mr. Charles Jarrott's 30-h.p. De Dietrich, be being neck and neck with a Humber bicycle. A couple of minutes later two 10-h.p. Wolseley cars followed, and within three minutes Capt. Deasy was in the garage on his 20-h.p. Rochet-Schneider, on which he last Sunday accomplished his remarkable non-stop run from London to Glasgow, which we record elsewhere. From this time onwards the cars came in rapidly, 21 having been noted by 6 p.m., including the Chenard and Walcker, the 2 Argylls, the 2 Sunbeams, one of the Georges Richards, the Farman Tonneau car, one of the Lanchesters, both the Arrol-Johnston's, Mr. Stock's De Dion, Miss Levitt on her Gladiator, the Gardner-Serpollet, the Brown and the Quadrant bicycles. The trial not being one of speed, of course the actual order of arrival has no bearing upon the results. In all, by 9 o'clock all but one of the competitors were in.

On Thursday morning 19 cars and 4 motor bicycles left the Leeds garage for London. The only point throughout Wednesday's run was in Yorkshire, near Settle, where the County Police made themselves particularly objectionable, and took the names and addresses of some six or seven of the drivers. Miss Levitt was one of the victims.

* * *

THE extension to the end of the month of the closing time for entries for the Belgian Circuit des Ardennes has brought in several new entries, including two more Wolseley cars.

STENOGRAPHY is responsible for our having last week given the address of Messrs. Johnson, Hurley and Martin as Oxford Street, Coventry, instead of Gosford Street, Coventry.

THE British agents for the Stanley steam car, which made such a good time on the Boston Hill Climb, of which we give a report elsewhere, are Messrs. Joseph Cockshoot and Co., Ltd., Great Northern Arches, Deansgate, Manchester.

DURKOPP motor vehicles are to be handled for the future in this country by Mr. F. Frentzel. The firm manufacturing this vehicle is one of the largest in Germany, employing about 5,000 hands. They build, in addition to motor bicycles, 2, 3, 4, 6, and 8-cylinder cars, and are making a speciality of motor omnibuses and lurries. We are informed that a company is in course of formation to deal exclusively with the products of this concern for Great Britain.

THE East Anglia Motor Carriers, Limited, is a company being formed to act as carriers and general agents, particularly to develop transit facilities in East Anglia. The headquarters will be at Ipswich, with depôts in London, Bury St. Edmunds, Chelmsford, Norwich, and Peterborough. Under the scheme it is proposed to acquire about 30 vehicles, 12 being heavy steam cars with trailers having a capacity of 6 tons per car apart from the trailer, and 18 smaller cars carrying 1½ tons per car. Regular services will be established simultaneously both ways between London and Ipswich, Chelmsford, Bury St. Edmunds, Norwich, King's Lynn, and Peterborough. It is stated that encouraging promises of support from some of the largest manufacturers and traders along the routes proposed to be worked have been obtained, and the company propose not only to undertake the distribution of the goods but to warehouse when necessary and stock at central depôts. Traders will be able to receive consignments by this means from London, and full return freights, it is hoped, will be obtained from the country by collecting agricultural produce throughout the Eastern counties. Under energetic and careful management the scheme should turn out well.

REVIEWS OF BOOKS.

"Encyclopædia Britannica." 10th Edition. Vol. 29 of the complete work. (Adam and Charles Black, Edinburgh and London; and *The Times*, Printing House Square, London.)

THIS volume of the 10th edition of the Encyclopædia Britannica, from "Glarus" to "Jutland," is in every way worthy of its predecessors, both in the high excellence and exhaustive character of the articles which it contains and the excellent standard maintained in the illustrations. Chief amongst the articles of interest to automobilists are those dealing with the gyroscope by Professor Greenhill and iron and steel by Professor Howe. Considering the interest which the Gordon-Bennett race is concentrating upon Ireland we might, perhaps, include at any rate the statistical portion of the article on that country.

The theory of the gyroscope is interesting to automobilists owing mainly to the fact that gyrostatic and gyroscopic actions arise owing to the rotation of the flywheels of explosion motors, and give rise to certain stresses and strains which were at one time, and in certain earlier arrangements found to be serious when the car was subjected to sudden changes of direction. Modern motor car construction has practically got over these troubles by alterations of design, but the problems involved are still of some importance to the automobile engineer. The article on the gyroscope contains but a very fragmentary general account of the phenomena it presents, and at once plunges into a highly mathematical treatment of the subject. This is, of course, useful and valuable, but had it been prefaced by a little more popular exposition no harm would have accrued.

Nothing but praise can be bestowed upon the elaborate article on the manufacture of iron and steel, a subject which cannot fail to have an interest for all engineers. The subject is brought well up to date, both from the point of view of theory and of practice, and of very special interest is the lucid and, at the same time, exhaustive summary of the result of recent researches into the various compounds of carbon and iron which confer upon steel its capacity for being hardened and tempered, and its other qualities. The great subject of alloy-steels resulting from the alloying of steel with other metals, such as manganese, nickel, chromium, and tungsten, is well summarised, and a short reference to the Harvey and Krupp process is introduced. The elaborate and admirably illustrated description of the recent developments of the industry on a big scale, particularly in United States blast furnace practice, and the recent improvements in open hearth steel manufacture, constitute the most valuable portion of the treatise. Full justice is done to the enormous cheapening of manufacture due to the introduction of the pig-casting machine, while similar recognition is accorded to the oscillating open hearth furnace, and the different variations in the chemical side of the open hearth process are also described. Altogether the article on iron and steel forms one of the best short recent text books on the subject with which we have become acquainted.

The article on Ireland is divided into a statistical and historical portion, the historical being confined to the period since 1879. The geography and statistics are well tabulated and arranged, and form a perfect guide book of information to anyone visiting the country.

Among other articles of general interest to the reading public may be mentioned the singularly comprehensive and attractively written article on modern Japan. It is doubtful whether the romantic modern history of that country has ever been presented more attractively or more dispassionately, although here and there, considering the astonishing amount of knowledge and intimacy with the country that the writer displays, his somewhat crude ideas on Buddhism are surprising. The volume contains a sympathetic and appreciative notice of the late Professor Huxley.

Like its predecessors, this volume of the Encyclopædia is prefaced by an essay on the application of the doctrine of evolution to sociological theory and problems, a not inappropriate subject by which to open the volume which contains a memorial to Huxley. The prefatory essay is luminous and suggestive, and gives a very good account of the growth and development of the great evolution theory and the discussions connected with it. We have, in reviewing previous volumes, referred to the excellent get-up of the series, and can only say that in this respect the volume under review is fully the equal of its predecessors.

STORAGE OF PETROL.—NEW REGULATIONS.

THE following Regulations have been issued by the Secretary of State under the 5th Section of the Locomotives on Highways Act, 1896, for the keeping and use of petroleum:—

In these Regulations the expression "petroleum spirit" shall mean the petroleum to which the Petroleum Acts, 1871 and 1879, apply, provided that when any petroleum other than that to which the said Petroleum Acts apply is on or in any light locomotive, or is being conveyed or kept in any place on or in which there is also present any petroleum spirit as above defined, the whole of such petroleum shall be deemed to be petroleum spirit.

In these Regulations the expression "storehouse" shall mean any room, building, coachhouse, lean-to, or other place in which petroleum spirit for the purposes of light locomotives is kept in pursuance of these Regulations.

1. The following shall be exempt from license under the Petroleum Act, 1871, namely:—

   (*a.*) Petroleum spirit which is kept for the purpose of, or is being used on, light locomotives when kept or used in conformity with these Regulations.

   (*b.*) Petroleum spirit which is kept for the purpose of, or is being used on, light locomotives by, or by authority of, one of His Majesty's Principal Secretaries of State, the Admiralty, or other department of the Government, and which is subject to special Regulations.

2. These Regulations shall apply to petroleum spirit which is kept for the purpose of, or is being used on, light locomotives, and for which (save as hereinafter provided) no license has been granted by the Local Authority under the Petroleum Act, 1871, and shall not apply to petroleum spirit which is kept for sale, or partly for sale and partly for use on light locomotives, and which must be kept in accordance with the provisions of the Petroleum Acts as heretofore.

3. Where for any special reason a person keeping petroleum spirit for the purpose of light locomotives applies for a license under the Petroleum Act, 1871, and the Local Authority see fit to grant such license, such petroleum spirit shall be subject only to Regulations 8 to 13, and the conditions of such license, in so far as the said conditions are not contrary to the said Regulations 8 to 13.

4. Where a storehouse forms part of, or is attached to, another building, and where the intervening floor or partition is of an unsubstantial or highly inflammable character, or has an opening therein, the whole of such building shall be deemed to be the storehouse, and no portion of such storehouse shall be used as a dwelling or as a place where persons assemble. A storehouse shall have a separate entrance from the open air distinct from that of any dwelling or building in which persons assemble.

5. The amount of petroleum spirit to be kept in any one storehouse, whether or not upon light locomotives, shall not exceed 60 gallons at any one time.

6. Where two or more storehouses are in the same occupation and are situated within 20 feet of one another, they shall for the purposes of these Regulations be deemed to be one and the same storehouse, and the maximum amount of petroleum spirit prescribed in the foregoing Regulation shall be the maximum to be kept in all such storehouses taken together. Where two or more storehouses in the same occupation are distant more than 20 feet from one another, the maximum amount shall apply to each storehouse.

7. Any person who keeps petroleum spirit in a storehouse which is situated within 20 feet of any other building whether or not in his occupation, or of any timber stack or other inflammable goods not owned by him, shall give notice to the local authority under the Petroleum Acts for the district in which he is keeping such petroleum spirit, that he is so keeping petroleum spirit, and shall renew such notice in the month of January in each year during the continuance of such keeping, and shall permit any duly authorised officer of the local authority to inspect such petroleum spirit at any reasonable time. This Regulation shall not apply to petroleum spirit kept in a tank forming part of a light locomotive.

8. Every storehouse shall be thoroughly ventilated.

9. Petroleum spirit shall not be kept, used, or conveyed except in metal vessels so substantially constructed as not to be liable, except under circumstances of gross negligence or extraordinary accident, to be broken or become defective or insecure. Every such vessel shall be so constructed and maintained that no leakage, whether of liquid or vapour, can take place therefrom.

10. Every such vessel, not forming part of a light locomotive, when used for conveying or keeping petroleum spirit, shall bear the words "petroleum spirit highly inflammable" legibly and indelibly stamped or marked thereon, or on a metallic or enamelled label attached thereto, and shall be of a capacity not exceeding two gallons.

11. Before repairs are done to any such vessel, that vessel shall, as far as practicable, be cleaned by the removal of all petroleum spirit and of all dangerous vapours derived from the same.

12. The filling or replenishing of a vessel with petroleum spirit shall not be carried on, nor shall the contents of any such vessel be exposed in the presence of fire or artificial light, except a light of such construction, position, or character, as not to be liable to ignite any inflammable vapour arising from such spirit, and no fire or artificial light capable of igniting inflammable vapour shall be brought within dangerous proximity of the place where any vessel containing petroleum spirit is being kept.

13. In the case of all petroleum spirit kept or conveyed for the purpose of, or in connection with, any light locomotive, (*a*) all due precautions shall be taken for the prevention of accidents by fire or explosion, and for the prevention of unauthorised persons having access to any petroleum spirit kept or conveyed, and to the vessels containing or intended to contain, or having actually contained, the same; and (*b*) every person managing, or employed on, or in connection with, any light locomotive shall abstain from every act whatever which tends to cause fire or explosion, and which is not reasonably necessary, and shall prevent any other person from committing such act.

14. These Regulations shall come into operation on the 18th day of March, 1903, from which date the Regulations dated 3rd November, 1896, and the 26th day of April, 1900, are hereby repealed.

NOTE.—From the above Regulations it will be seen that there are two methods in which petroleum spirit required for use in motor cars may be kept. The first of these will be the usual method, namely, to keep in accordance with these regulations; but where a person finds that for some special reason he cannot observe one of the Regulations 4, 5, or 6, he may resort to the second method, namely, to apply to the Local Authority for a license. In such cases the place will be examined by the Local Authority Officer, who will advise the Local Authority as to its suitability for license. Where a license has been granted Regulations 4 to 7 no longer apply.

In no case is petroleum spirit kept wholly or partly for sale exempt from the necessity of a license.

* * *

MR. LOUIS M. BERGIN, the well-known Secretary of the Dunlop Tyre Company, has now been also appointed General Manager. During Mr. Bergin's twelve years association with the company he has earned an enviable reputation for tact and courtesy with the public and the trade, and has entirely secured the confidence of his Directors. In his new capacity he will be entrusted with large discretionary powers to deal promptly with all special matters which may arise between the company and its trade customers.

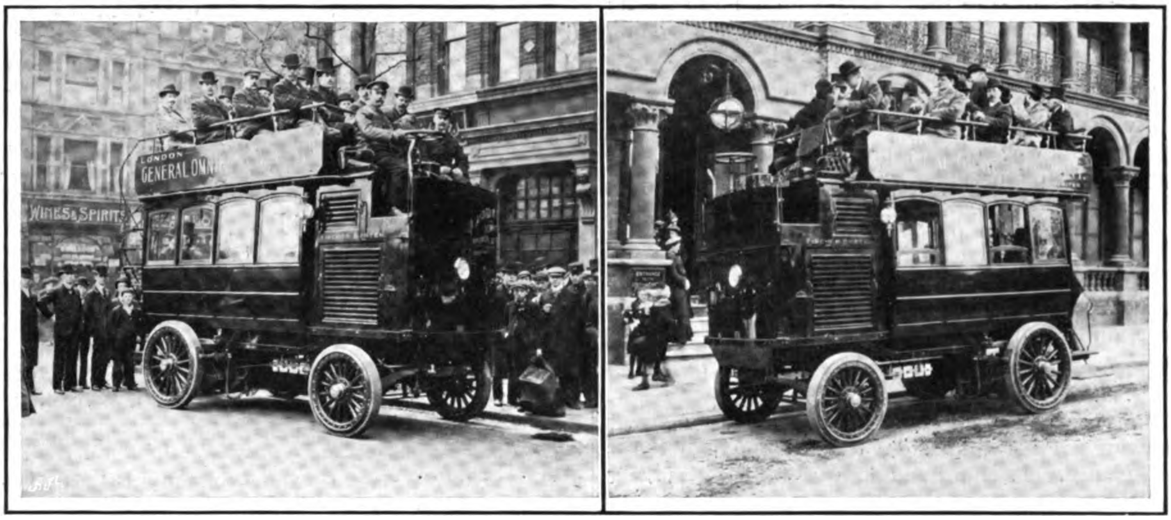
THE run of the Midland Automobile Club to-day (Saturday) is to Stratford-on-Avon, cars meeting at the Shakespere Hotel for tea at 5 o'clock.

LAST Saturday a run to Tintern was arranged by the South Wales and Monmouthshire Automobile Club, which now numbers 70 members, and has headquarters at Cardiff. On the 23rd inst., a visit will be paid by the club to Captain Hughes Morgan, at the Castle Hotel, Brecon.

LAST month the Alresford Automobile Club was founded, and amongst the members who have since joined are the Hon. Douglas Carnegie, the Hon. A. Baring, the Hon. H. L. Bruce, Sir John Shelley, Bart., Colonel H. Stratton Bates, Major W. Nicholson, M.P., Captain Faith, Messrs. H. H. Walford, A. Hobson, G. Ferrant, G. Willoughby, J. R. Shield, G. R. Shield, and Dr. Jollye. Mr. G. Ridley Shield has accepted the honorary secretaryship, and the first club run was made at the commencement of May to Farnham, where a very pleasant outing was taken part in by Colonel Bates, Dr. Jollye, Mr. A. Hobson, Mr. J. R. Shield, and Mr. G. Ferrant, who each conveyed several passengers on their cars, among whom were some ladies.

LAST Saturday the first balloon chase of the season by motor car, arranged by the Aero Club jointly with the Automobile Club, took place, starting from the Crystal Palace, when Mr. Frank Butler, accompanied by Mr. C. F. Meade, of Baliol College, Oxford, and Mr. Micklethwaite ascended in "Aero Club 1," and the "Graphic" balloon was occupied by Mr. C. F. Pollock, accompanied by Mr. L. A. Bucknall and Mr. Myers. The only motor car which started from the Palace was a 7-h.p. Panhard, driven by Professor Huntingdon, of King's College, although several other cars took up the running beyond the Palace grounds. In both cases the balloonists were successful in evading their pursuers, although it must be confessed that they were in this respect much favoured by the weather. "Aero Club 1" descended ultimately at Catford, and the "Graphic" balloon returned to *terra firma* in Greenwich Park in the midst of the violent thunderstorm which passed over London during the afternoon.

ON Tuesday a demonstration was organised to convince a number of the leading Paris Municipal Councillors that the existing speed limit of 12 kilometres per hour in Paris and the Bois de Boulogne is an absurdity in view of the exceptional control which drivers have over their machines. The programme for impressing the authorities, although somewhat theatrically arranged by the A. C. de France, was unquestionably effective. Practical demonstrations of the brake power of a car running side by side with one of the ordinary cabs were given. A fashionable carriage drawn by spirited horses belonging to Mdlle. Balthy, a Parisian music hall actress (who entered into the spirit of the demonstration and offered the use of her carriage for the purpose) was also requisitioned, while gendarmes unexpectedly called upon the cars to stop, and in other cases suddenly darted out and threw dummy figures immediately under the wheels of the oncoming vehicles. In each case of these "surprises" the cars were brought up in time to avoid what would in the ordinary course with other conveyances have



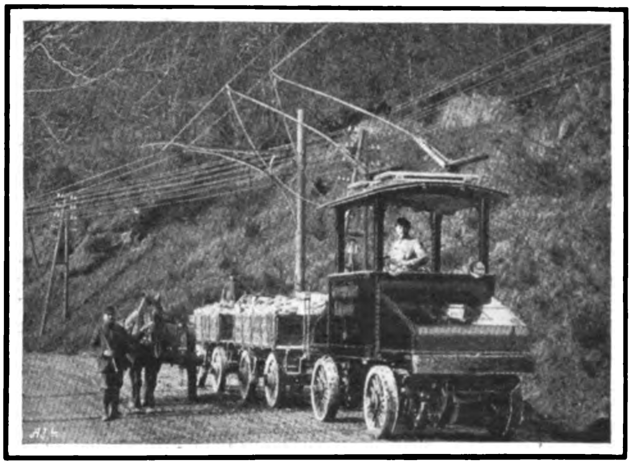
The Fischer Petrol Electric Omnibus seen from both sides, with passengers on board, on a trip to Richmond and back. We last week described this new vehicle, which has been built to the requirements of the London General Omnibus Company. The driver in charge of the 'bus is an old horse-'bus driver, and has even less difficulty in handling his new charge than with his horses.

been a bad accident. As regards stopping power, the cabs required at least double the distance to draw up in than the cars going at the same speed needed. With spirited horses the distance was ten yards for the horses against two yards for the car. Some 30 or 40 cars assisted in the demonstrations, and it is hoped the effect will be so convincing upon the municipal authorities that considerable modification of the present stringent speed regulations will be shortly announced. An unrehearsed "surprise stop," tried by one of the Councillors, who threw his umbrella in front of a passing motor car, was hardly appreciated by the Councillor personally, although the result created considerable amusement amongst his fellow passengers. As the unrecognisable umbrella was returned to its owner, he was informed that the car in question was not one of those being used in the demonstration, but an ordinary passing automobile, the occupants of which no doubt wondered vastly at such apparently eccentric behaviour on the part of a respectable looking gentleman.

THE Water Committee of the city of Birmingham have recently placed an order with the Ariel Motor Company for one of their 16-h.p. cars. This machine has been purchased for the use of the engineer in charge of the new water system which has been carried out by the Committee, and by which Birmingham is to be supplied from the Elan Valley, in Wales, a distance of about 100 miles. The car will be fitted with a tonneau body, accommodating seven passengers, and the two middle seats will be removable, in order that the space occupied by them may be utilised for carrying tools when necessary. Many points on the route cannot be reached within several miles by the railway, and an automobile appears to be the only possible means by which speedy transit to any particular spot on the route can be ensured, unless indeed a large number of assistant engineers were to be appointed, and assigned different districts along the road near which the pipes are laid, an alternative which would, of course, involve considerable expense. The car will enable the engineer to take two or three workmen with him and a large supply of tools, and the manufacturers have guaranteed that it will carry six persons up a specified hill, which is one of the steepest in Wales, at a speed of seven or eight miles an hour. This is just one of those cases in which a motor car can alone perform the necessary work, and we must congratulate the Ariel Motor Company on having secured the order.

THE dinner of Founder Members of the Automobile Club is postponed until the autumn.

THE Roads Improvement Association will, for the future, be located in a special room at 119, Piccadilly, under arrangement with the Automobile Club.



The Schiemann Railless Electric Tractor, with trailers, at work on a road in Westphalia, illustrating the system to which we referred last week. The tractor has no batteries on board, but takes its current through the trolley poles from the two overhead conductors.

It has been decided to voluntarily wind up the Steam Car Company, House's System, Ltd. Mr. G. G. Stickland, of 88, Chancery Lane, has been appointed liquidator.

The driver of a motor dray, on Tuesday, was summoned in the City for drawing a trailer unfitted with a brake at a greater speed than four miles an hour in Cheapside, the time being 1.30 p.m. The magistrate, in dismissing the summons, no doubt from personal knowledge of the traffic in this thoroughfare at that hour, appreciated the statement of the defendant that anything beyond a walking pace under the circumstances was an impossibility. The action of the City Police, on the surface, certainly appears to have been vexatious.

The Dunlop Tyre Company have issued a sheet of road charts showing gradients, mileage, surface, and dangerous hills at a glance. It is printed in a useful form, as each portion of the contour can be cut out separately for the various routes. The roads which the first chart sheet covers include London to Ramsgate, and Dover, Bath, Folkestone, Cheltenham, Hastings, Warwick, Brighton, Birmingham, Worthing, Nottingham, Portsmouth, Norwich, Southampton, and Yarmouth. The company will send this chart gratis to anybody remitting three stamps to cover the cost of postage.

Olympia is to be the location of a permanent automobile exhibition. The programme is an ambitious one. Besides serving as a depôt for the sale of motor cars of every description, it is proposed to hold periodical displays and competitions in a large covered arena. Motor fire-engines are to be a special feature, with demonstrations under the auspices of County Councils, Local Governments, chiefs of Fire Brigades, &c. As an off-shoot of the scheme, motor boats will be taken in hand and regattas on the River Thames arranged. The exhibition is to be open from the middle of May for the summer months from 9 a.m. till 7 p.m., and in the winter until 6 p.m. Admission on "ordinary days" is to be free.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

AUTOMOBILE CLUB'S QUARTERLY 100 MILES TRIALS.

To the Editor of The Automotor Journal.

Sir,—I see that Mr. Cohen takes exception to the note appended to my report on the running of the 10-h.p. Chenard car in the Quarterly 100 Miles Trial. I did not in any way suggest that the car should have been driven faster, but I certainly consider that the rules were broken by the stopping of the engine on every possible occasion. I told Mr. Cohen's representative that to earn a Non-Stop Certificate it was necessary for the whole distance to be covered without either the engine or road wheels stopping, except, in the case of the latter, for traffic.

In spite of this the engine was at rest for at least 25 per cent. of the total running time.

I think, therefore, you will see that my note was only fair comment, and, indeed, was a necessary addendum to my report to the Club Committee.

Yours faithfully,
Ernest de Wilton.

May 8th.

LAW REPORTS.

The Devon Traction and Motor Company (Limited).—Mr. Justice Kekewich, in the Chancery Division, on Tuesday, made an order restoring the name of the Devon Traction and Motor Company (Limited), to the register of joint stock companies, it having been removed owing to the omission of the secretary to make the necessary returns last year. The Board of Trade did not oppose the application.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories either as their principal or part of their objects.]

Birmingham Aluminium Casting (1903) Company (Limited).—Capital, £46,000 in 3,060 seven per cent. cumulative preference shares of £1 each, and 429,400 ordinary shares of 2s. each. Object, to acquire the assets and undertaking of the Birmingham Aluminium Casting Company (Limited).

Hele-Shaw Patent Clutch Company (Limited).—Capital, £50,000 in £1 shares. Object, to acquire as a going concern the business carried on at Pembroke Place, Liverpool, of the Imperial Engineering Company. First directors, H. S. Hele-Shaw, J. E. Jose, and T. T. Vernon.

Lanchester American Patents Syndicate (Limited).—Capital of £6,600 in 1,600 "A" shares of £1 each, and 500 "B" shares of £10 each. Object, to acquire the American patents for certain inventions by F. W. Lanchester. First directors, F. W. Lanchester, A. Whitfield, and J. V. Pugh.

Mercedes Company (Limited), Edinburgh.—Capital, £1,000, in £1 shares. (*Scotch Company*).

Motoria (Limited), 2, Staple Inn, W.C.—Capital, £1,000, in £1 shares. Object, to acquire the business of F. Jessett, in London, of motor car and accessories salesman.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published May 7th, 1903.

13,292. J. F. Mason. Motor cars.
13,535. W. Hartmann. Cam driving gear.
14,844. S. de Jong and Co. Valve mechanism.

Published May 14th, 1903.

9,078. — Hayward and others. Internal combustion motors, the said motors being easily convertible into steam engines.
9,111. — Northey and others. Electromagnetic clutches and variable gear.
9,719. — Clement. Motors for velocipedes.
10,002. Wolseley Tool and Motor Car Company (Limited). Differential gear.
10,303. — Gifkins. Variable speed gears.
10,624. — Chapman. Self-propelled road vehicles.
11,094. — Eudelin. Clutch and brake devices.
12,695. — Porsche and — Lohner. Steering devices.
13,775. Soc. Anon. des Automobiles Peugeot. Condensers for automobiles which work with superheated steam.
21,833. — Steinhauser and others. Friction clutches.
25,725. — Holt. Arrangement for driving motor cycles by means of a ball-bearing direct propelling rod combined with a duplicate hub.
25,726. — Hudson and — du Sautoy. Driving, disconnecting, and variable-speed gear.

Published May 21st, 1903.

7,376. — de Simone. Differential gear.
9,457. — Mair. Variable-speed gear.
9,523. Long Acre Motor Car Company. Water tube steam boilers.
10,070. — Henwood. Steam boilers and furnaces.
11,233. — Roe Driving and speed gear.
12,166. — Iden, and Motor Manufacturing Company (Limited). Means for regulating the supply of explosive mixture.
13,278. — Pilkington. Cylinders.
13,862. — Bevilacqua. Water tube steam generators.
14,523. — Maxfield and — Garrard. Electric ignition devices.
19,753. Fairbanks, Morse, and Co. Carburetters.

Applied for in 1903.

Published May 7th, 1903.

1,311. Soc. Automobiles Decauville Aine. Frames.

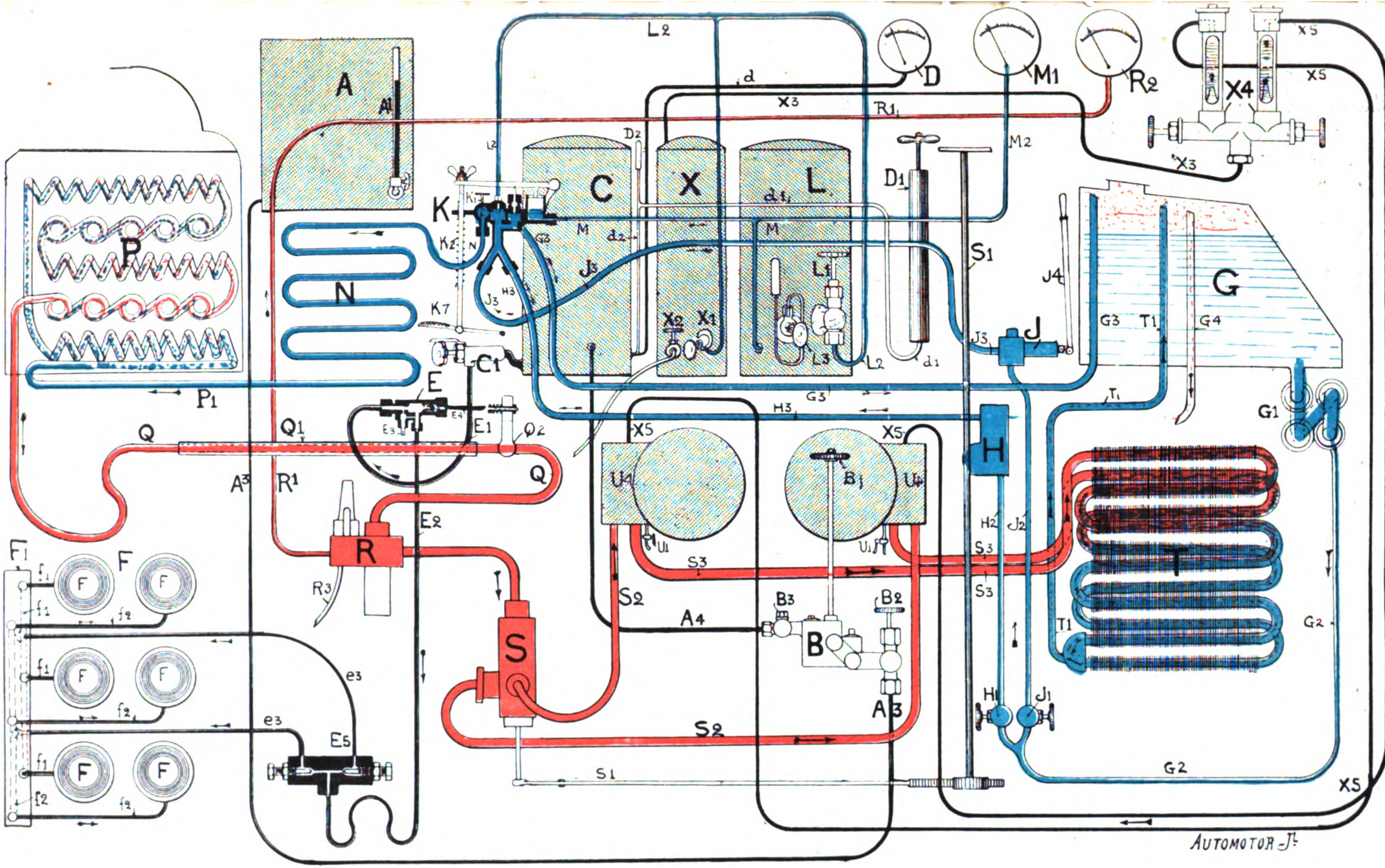
Published May 14th, 1903.

676. — Hill. Tyres.
2,403. — Gould. Storage battery systems.
3,306. — Friedmann. Feed pump for steam generators.
3,989. — du Kando. Motors for electric vehicles.
4,262. — Donkin Speed regulating and steering mechanism.

Supplement to THE AUTOMOTOR JOURNAL, May 16th, 1903.

Fig. 17.—THE CHABOCHE STEAM SYSTEM. DIAGRAM OF CONNECTIONS.

Water:—Blue; Steam:—Red; Fuel and Lubrication:—Black.



A, fuel tank.
A^{1}, gauge glass.
A^{3}, supply pipe to pump.
A^{4}, delivery pipe to pressure chamber.
B, fuel pump.
B^{1}, fuel pressure regulator.
B^{2}, shut-off cock.
B^{3}, check valve.
C, fuel pressure tank.
C^{1}, hand fuel regulator.
D, fuel pressure gauge.
D^{1}, hand-pump for air in **C**.
D^{2}, nipple for tyre pump.
d, pipe to pressure gauge.
d^{1}, air-pipe from hand-pump, **D^{1}**.
d^{2}, pipe from pressure tank to air-pumps.
E, automatic fuel regulator.
E^{1}, delivery pipe to ditto.
E^{2}, delivery pipe from **E** to burners.
E^{3}, adjustable by-pass.
E^{4}, valve spindle.
E^{5}, two-way fuel fitting.
e^{3}, pipes from ditto.
F, burners.
F^{1}, distributor.
f^{1}, pipes from distributor to rear burners.
f^{2}, ditto to forward burners.
G, water tank.
G^{1}, feed water cooler.
G^{2}, feed pipe.
G^{3}, return-pipe from automatic by-pass to tank.
G^{4}, overflow pipe.
H, mechanical water feed pump.
H^{1}, 3-way main cock for ditto and drain.
H^{2}, pipe from cock to pump.
H^{3}, delivery pipe.
J, hand water feed pump.
J^{1}, main cock for ditto.
J^{2}, pipe from cock to pump.
J^{3}, delivery pipe.
J^{4}, hand lever for pump.
K, automatic water regulator.
K^{1}, cock regulating water feed to boiler.
K^{2}, spring controlling boiler pressure.
K^{7}, accelerator pedal.
L, feed-water pressure chamber.
L^{1}, cock controlling feed-water connection to pressure tank (**L**).
L^{2}, pipe connection between **L** and **K**.
L^{3}, cock controlling connection for tyre pump.
M, pipe from pressure tank (**L**) to automatic fitting (**K**).
M^{1}, pressure gauge for tank (**L**).
M^{2}, pipe to pressure gauge.
N, thermal storage coil on water feed.
P, boiler.
P^{1}, feed pipe to boiler.
Q, steam pipe from boiler.
Q^{1}, pipe surrounding steam pipe.
Q^{2}, connection of steam pipe with automatic fuel regulator (**E**).
R, safety valve.
R^{1}, pipe to steam pressure gauge.
R^{2}, pressure gauge.
R^{3}, blow-off pipe.
S, throttle-valve.
S^{1}, operating gear for ditto.
S^{2}, steam pipe from throttle-valve to engine.
S^{3}, exhaust pipes from engine to condenser.
T, condenser.
T^{1}, return pipe from condenser to water tank.
U^{1}, drain cocks on engine.
U^{4}, steam chests on cylinders.
X, pressure chamber for lubricating oil.
X^{1}, cock controlling connection with pressure feed.
X^{2}, blow-off cock.
X^{3}, pipe to sight feed lubricator.
X^{4}, lubricator.
X^{5}, pipes from lubricator to steam chest.

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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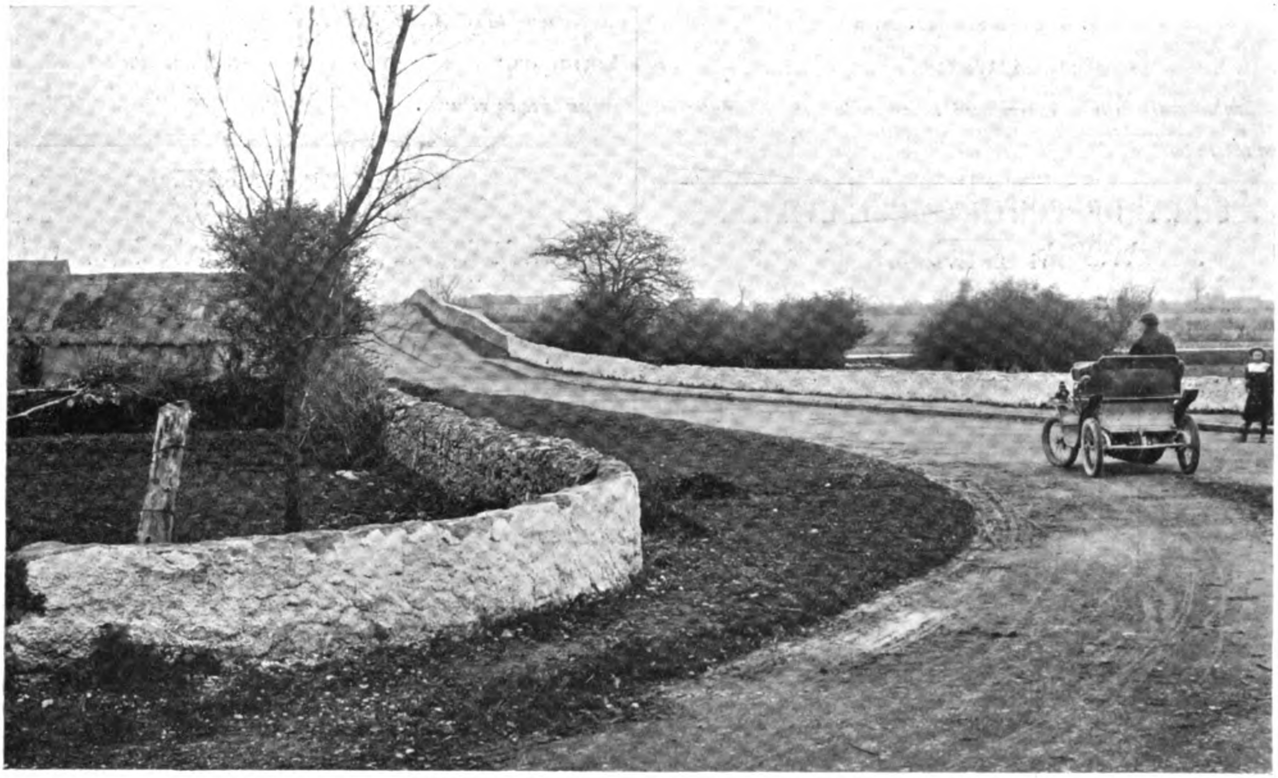

(Photo by Lawrence, Dublin.)

THE GORDON-BENNETT CUP COURSE.

Mageney Bridge, showing one of the sharp double turns, and a typical bridge. On the other side the road runs parallel with the river.

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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
May 23 ...		Scottish Auto Club Hill Climb.
*June 13 ...		Gymkhana at Ranelagh.
June 20 ...		Manchester Auto Club Hill Climb.
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park; Motor Cycle Time Trials; Viceregal Garden Party.
July 6 ..		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy; 4 Mile Motor Cycle Race (Newcastle, co. Down).
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork.
		Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
*July 24 ...		100 Miles Quarterly Trial.
July 24-25 ...		Southport Speed Trials.
*August 10-22 ...		Tourist Motor Bicycle Reliability Trial.
*September ...		The 1,000 Miles Trial.
1904.		
...		*Light Van Trials.
*Feb. 12-24 ...		Crystal Palace Exhibition.
May.		Electrical Vehicle Trials (6 days).

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
May 24, 25, 26 ...	Paris-Madrid. Speed Section. Entries until May 15. Double fees April 16 to May 15.
May 25-30 ...	Hanover Alcohol Van Trials (German Agricultural Society).
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-28 ...	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21 ...	Circuit des Ardennes.
June 28	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 12-19 ...	Ostende Automobile Week.
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16 ...	Race Trelex-Saint-Cergves (Swiss A. C.).
Sep. 6-13 ...	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September ...	Udine Exhibition (Italy).
Oct. 15-21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

THE LATEST PROPOSED BILL.

THE Legislative Committee of the Automobile Club have recognised that the position of the legislative question at the present moment is, as we pointed out last week, critical. They have therefore put forward further amendments to their Bill, or, perhaps it would be more correct to say, a new Bill has been introduced. Those parts of the measure which are new are shown in our reprint in italics, and consist practically of Sections 6 to 10. Other slight alterations are in Section 5, where the words, "rate of speed" are changed into "the speed," the diminution of tare weight in Section 11 from 6 tons to 3, and the postponement by a year of the date at which the proposed measure should come into force. It is highly important that considering the imminence of official legislation, the Club Committee, at any rate, should have formulated the proposals on which they are agreed, as a guide to what prominent automobilists regard as essential. It would have been better if the whole Club could have been ranged behind these proposals, but, owing to the employment of certain tactics, that has been rendered impossible. Still there is no doubt that in whatever way the vote now being taken may fall out, the Government will attach considerable importance to the Club Committee's measure. The only consideration that may possibly discount the attention their last Bill will receive may be the number of different proposals that they have previously put forward.

The added sections provide for the licensing of professional drivers, for costs being granted to any person who is improperly summoned, and, in a somewhat imperfect way, for the corroboration of police evidence. If a policeman proceeds against a driver on any charge, and for not stopping when called upon, and takes his number, he must provide confirmatory evidence that the driver was called upon to stop and refused to do so. We are glad that the Club Committee have recognised the importance of a provision of this kind. We put it forward as long ago as October 25th last, and the necessity of it is we should have thought obvious from the first. If some such provision is not introduced a motorist may find, after taking a fifty or hundred miles run, that he receives half a dozen different summonses for offences alleged to have been committed during this run of which he has no recollection, and in regard to which he is consequently quite unable to defend himself.

While we gladly recognise that the importance of confirming police evidence is recognised to this extent, we do not think that the section in question goes far enough. The police evidence, as we have insisted over and over again, should require independent confirmation in *every* particular, and the Section ought to be altered to give it this effect.

A GOOD OMEN.

Nothing could be more emphatic than Mr. Long's speech delivered last Saturday at Trowbridge. He was speaking in an agricultural district, and he explained to his hearers that quite a serious proportion of his time was spent in receiving deputations from agricultural districts desiring, if not the actual abolition of the automobile, at any rate its restriction and limitation to the greatest possible extent. Such people, of course, will, as Mr. Long admitted, bitterly resent the removal of the present speed limit. Mr. Long, however, did not beat about the bush. He pointed out that these good people do not realise how completely the law is at present set at defiance. He characterized the present law as "farcical" and observed that the best meaning automobilists in the world would be unable to go 10 or 12 miles without breaking it. The limit, in fact, is never observed and cannot be maintained. At the same time Mr. Long recognised the necessity of providing means of identification, and visiting with severe penalties any drivers who neglect what he describes as the statutory duty of proceeding along public roads so that the "general safety of the general community" shall be preserved. This is all that motorists want, or that can really be demanded by the public at large. If Mr. Long's speech is, as it appears to be, a forecast of his measure, there is every hope that his measure will give satisfaction all round, for it certainly suggests that his proposed Bill will be practically on the lines of the draft put forward by the Club Committee, the general provisions of which we have supported throughout. The omen, at any rate, is a good one. So, too, was the spirit displayed in the debate in the House of Lords on Tuesday, raised by the Earl of Wemyss under cover of a question to the Secretary for Scotland. Everyone who took part in it, even including Lord Balfour of Burleigh himself, were distinctly favourable to amendment of the law on the lines Mr. Long suggested.

A CASE IN A NUTSHELL.

Mr. G. R. Sims, to whose amusing contributions to the automobile problem we alluded last week, keeps up the running in the *Referee*. The desire of those good people who wish, they say, to develop the motor industry but confine the speed of motors to the present "farcical" limit, he very aptly compares to the pious editor who commissioned an author to write a story about buccaneers, in which there must be no cursing or swearing and no hard drinking. People like the motor, says Mr. Sims, because it goes fast and covers the ground. If you prevent it doing that you will keep people from liking it, and you will stop development. You will also limit usefulness. That is the case in a nutshell. With his usual delicate sarcasm, Mr. Sims continues to elaborate the suggestion that the speed problem will only be solved by motorists betaking themselves to the upper air. The following amusing poem embodies Mr. Sims' vision of the future:—

The Sky Policeman's Story.

A.D. 1950.

'Twas yesterday, your Worship, a little after two,
As me and P.C. 60 was in our air canoe,
I see the private airship Two-seven-six-ought-A,
A bein' druven reckless the wrong side of the way.

I'd just, to holler "Steady!" took up my megaphone,
When into me he smashes, and out we both was thrown;
I come down on the pavement—my air-suit broke my fall,
Which bein' blown-out rubber, I bounded like a ball.

The fixed point airboat see it, and started in pursuit,
An' come up with defendant about the Kyles o' Bute;
They took defendant's number and brought him down to earth,
Him all the time a-swearin' for all as he was worth.

I've cautioned him, your Worship, for furious sailing twice,
And all he said in answer was "Bobby, what's your price?"
To all the sky policemen he's well-known everywhere,
Sam Sailaway, they call him, the Terror of the Air.

THE RECKLESS EMPLOYEE.

In the case of Nichol *v.* Beresford, in which a car owner was mulcted in heavy damages owing to his driver running down a cyclist on an occasion when he was not even present, and on a route on which he had not been ordered to drive, emphasises what is really a very serious situation for automobilists. A car owner need not be on his car, and the driver may (as drivers often do) be proceeding on quite a different route from that which his employer intended, and yet, if any injury is done for which the injured person can recover damages, it is the unfortunate car owner who has to pay up. The servant is still within the "scope" of his employment. But with all due deference to the finding of the jury, with which the judge appeared to concur, in the case of Nichol *v.* Beresford, we rather doubt whether when a driver is distinctly told to take one road and deliberately for his own amusement or pleasure takes another, he is in this sense within the scope of his employment. Practically the employer has no redress. Of course, he could sue the driver for the damage he had occasioned, but in ninety-nine cases out of a hundred he would get very little. If the accident was the result of criminal negligence the police might also prosecute the driver, but that would be of little consolation to the car owner. Probably his best course is to insure. It is not very satisfactory, but it may be the wisest thing to do.

FROM the point of view of the interests of automobilism, however, the question has a different appearance. A great deal of the reckless driving which has given rise to animosity against the motor car has been committed by drivers who are either on their way home, after having left their employer at his destination, or taking his car out—often for the benefit of their "lady" friends—during his absence. Prosecution of these worthies by the Automobile Club, and the resulting publicity that it would attain, might have a beneficial effect. At any rate, the drivers who have been found guilty of these practices should certainly be entered on the Club "d'ossier." Perhaps, too, the general custom of insuring might do something to check it. Insurance companies would be disinclined to insure where men with a bad record are employed, and this would tend to prevent their getting further situations.

ALCOHOL AS FUEL FOR MOTORS.

THE increasing difficulties of procuring an adequate supply of light hydro-carbon fuels for automobile purposes, to which we referred last week and on other occasions, forcibly suggests that automobile engineers might really direct their serious attention, as has been largely done on the Continent, to the utilisation of alcohol. Certain difficulties have been encountered in the employment of alcohol in motor car engines. They have been largely got over both in Germany and in France. They do not appear to have been nearly as great or as serious as those involved in the utilisation of kerosene. It is also quite certain that alcohol suitable for the purpose might be produced in this country (if the Government would consent to a revision of the law) cheaper than petrol of workable density and volatility can be now produced, and probably much cheaper than it will be obtainable in the near future. The reports made by Messrs Ringelmann and Sorrel on the official trials of alcohol in Paris last year, which have recently been published, are therefore highly encouraging. They show that when proper precautions are taken, the carburettor suitably adjusted and arranged, and the dimensions of the engine and the compression employed adapted to the circumstances, most of the allegations made against alcohol as a fuel are without foundation. It does not necessarily cause sticking or corrosion of the valves or inlet passages, or carbonisation inside the cylinder. The recommendations made are of considerable interest. They prove that a carburettor suited for working with petrol is not suitable for alcohol. In general, the carburettor must be increased in size. In general, also, the reports recommend that for cylinders of the same size the dimensions of the inlet valves should be increased. These are alterations which will be recognised as far from serious. It seems, it is true, that less power can be obtained from the same engines. It appears, too, that starting with alcohol presents some difficulties. A system which has been found to work well, and is in daily operation in Germany for heavy lurries, is to start up with a small amount of petrol and when the engine is hot to employ the alcohol through a separate carburettor which is exhaust-heated. These variations, however, do not amount to very much, for certain purposes at any rate, and should a heavy increase take place in the cost of petrol (and the Government wake up to the importance of rendering alcohol available) it is probable that automobilists will be able to employ alcohol. In the meantime, however, it is possible that the difficulties involved in the use of kerosene may be satisfactorily got over.

THE LEGISLATIVE QUESTION.

OUR correspondence columns this week contain a thoughtful and suggestive letter from Mr. R. Haddan, dealing with the particular point in the legislative programme of the Club Committee which is summed up in Section 5 of their proposed Act, viz., the alteration of the law as laid down in Mayhew *v.* Sutton. Mr. Haddan very rightly points out that the only way to reverse this decision is to include in the proposed Bill a section to the effect that "no case of dangerous driving can be proved unless evidence is given that a person was actually in danger." Mr. Haddan thinks that this would be going a great deal too far and that there are cases, notably on roads through populous districts or on very winding roads, where there is really danger or at any rate where motorists ought never to drive at high speed even when no other users of the road are present. Mr. Haddan therefore proposes to deal with this particular point in any proposed Bill by introducing a provision that drivers shall only be punishable when "proceeding on the highway at a speed or in a manner inconsistent with either (*a*) the safety of other traffic or passengers actually upon such highway, or (*b*) the extent of highway visible to the motorist." This proposal appears to us a very sensible way of dealing with the question and it might be advantageous to substitute it for Section 5 of the Committee's Bill; or, rather, perhaps we would say to keep it in reserve for Committee as a concession.

THOUGH we agree with Mr. Haddan's conclusion, we would point out, at the same time, that with his view of the decision in Mayhew *v.* Sutton we do not agree. He says: "The Court did not say what evidence *was* necessary, but only that it was not essential to proving the case that some person must be shown to have been in actual danger." But the decision is of much wider and more far-reaching import than this—it may have the effect of causing the judges to regard the prohibition in the old Highways Act of 1835 as absolute. This Act prohibits a number of things being done on the highway. Amongst others are the playing of football or any other game "to the annoyance of any passenger or passengers," pitching any tent, booth, or stall, or encamping on any part of the highway, or making a fire, or "wantonly firing off any gun, squib, rocket, serpent, or other firework" whatsoever, within 50 feet of the centre of the road, and baiting bulls upon it. These are all prohibitions beyond and above the one with which motocarists perhaps will become most familiar, that of driving "furiously, so as to endanger the life or limb of any passenger."* Cases on most of these points have come before the Divisional Courts, and the Courts have taken two views of them. Some they have regarded as absolute prohibitions, others they have regarded as merely contingent prohibitions; thus it has been decided that any encamping on the road is *absolutely* prohibited, though no passenger may have been annoyed or inconvenienced by it; playing football and making a fire have, however, been held not to be absolute prohibitions, that is to say, evidence of inconvenience to individuals must be proved. Curiously enough, there does not appear, as far as we are aware, to have been a ruling case deciding whether the prohibition of driving "furiously, so as to endanger the life or limb of any passenger," is an absolute prohibition or not. Now the decision in Mayhew *v.* Sutton amounts to maintaining that the prohibition in the regulations made under the Act of 1896, is absolute, and the danger is that even if this Act is abolished the ruling will be held to be a ground for interpreting the Act of 1835 in a similar way. To effect, therefore, by any proposed legislation what Mr. Haddan very sensibly suggests should be done, it would appear necessary to introduce a clause somewhat of the following nature:—"No driver of any light locomotive shall be deemed to be driving his carriage furiously, in the sense of 5 and 6 William IV., cap. 50, section 78, unless he is proceeding in a manner inconsistent either with the safety of other traffic or passengers actually upon the highway at the time, or on a portion of such highway where a reasonable length is not visible to the motorist at one time." This, it appears to us, would attain what Mr. Haddan has in view without incurring any dangers as far as the law is concerned, but it must always be borne in mind that in all these cases police evidence is very far from being above suspicion, and that, therefore, a great deal has to be said in favour of totally reversing the law as it at present stands, and really requiring evidence of danger to persons, for this would have the same effect as the proposal on which we have always insisted, viz., that confirmation of police evidence by that of independent witnesses should be required. We would prefer to see Mr. Haddan's proposal not embodied in a draft Bill for the present, as we are convinced that the interests of automobilists would be most effectively safeguarded by Section 5 of the Club Committee's proposed measure. If, however, it is found in Committee that some concession on this point is necessary, then let Mr. Haddan's proposal, amended in the way we suggest, be put forward as a last resource.

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* Perhaps the framers of the Act—it was in the old stage-coach days—had the passengers in the vehicle in mind quite as much as those on the road. At any rate, "passengers" has been altered into "persons" in the Local Government Board regulations.

THE SONG OF SPEED.

We believe that we were the only automobile paper who really expressed their feelings anent the alleged poem on the motor car, by Mr. Henley, entitled the "Song of Speed." Some of our contemporaries more or less prostrated themselves before the not very musical production, and others, though they did not seem to like it, swallowed it much as a patient takes a pill. Mr. E. D. Albert, of Clapham, in the *Daily Express*, raises a forcible protest. He does not like the automobile and he does not like Mr. Henley's "poem." In fact, the latter appears to have exasperated him to such a degree that he gets rid of quite a record string of adjectives at the expense of the new locomotion. Perhaps the best way to judge of a poem is by its results. A poem that really did justice to automobilism would make converts and friends. One that merely still further exasperates its enemies, stands, we think, self-condemned.

THE RESULT OF PROVOCATION.

We have on more than one occasion drawn attention to the extreme foolishness of abusing the tolerance both of the people and police in Ireland by frequent furious driving. Hitherto the attitude of the authorities in that island has been most indulgent to motorists. Of course, a minority have abused (as usually happens) this tolerance. We and others have warned them, and now the inevitable result has taken place. For the first time in the history of Ireland and automobilism the police have prohibited a speed contest on the roads arranged by the Motor Cycle Union of Ireland. No summonses were actually issued, but the police drew up in force and prepared to take the names and addresses of those who intended to engage in the contest, and the Committee of Management consequently decided to abandon it. The situation is a forcible example of the way in which the thoughtlessness and want of consideration of the minority interfere with the progress of the industry.

MADE IN GERMANY.

If it is not heresy to say so, we admit that it would appear that some things are done better in Germany than in this country. A motorist was recently summoned by a Berlin policeman for furiously driving along certain streets at a certain hour of the day. He was convicted in the court which corresponds to our petty sessions, and appealed to a jury in Berlin. One of the officials of the higher court drove the car over the prescribed route at the time of day when the accusation was made, and several of the jury went with him. They all came to the conclusion that the alleged speed was under the circumstances impossible, and the case was dismissed.

Every now and then there reaches us a wail, not that there is nothing like leather, but that leather as a trade is nothing like as good as it used to be. It is generally saddlers in country places who raise this dirge, and no doubt the introduction of the automobile has produced a certain local effect in the saddlers' business. We are glad, however, to learn that the London saddlers do not think they have much to fear. Most wealthy people, they say, who are adopting motor cars, keep their horses on as well. Besides, after all, there is at any rate a great deal of leather work connected with the finishing of motor cars. We have before advised saddlers to turn their attention to some extent to this line of business, and we repeat the advice.

THE MOTOR VOLUNTEER CORPS.

The duty for General Oliphant, commanding the Home District, between the War Office and the Agricultural Hall, was carried out last week by Mr. Henry Edmunds.

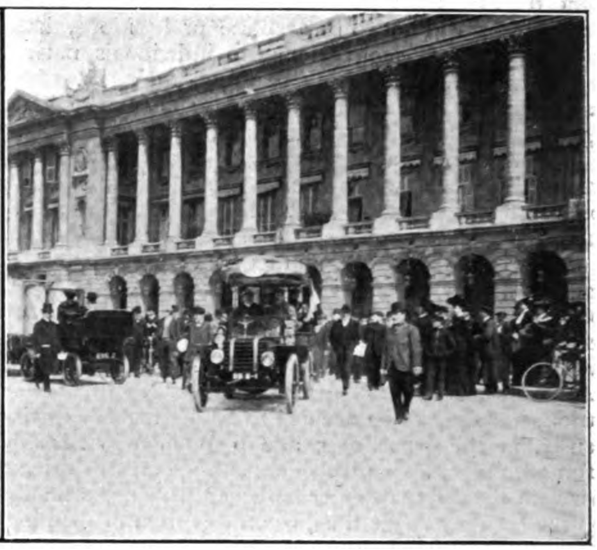
One day last week Capt. Skeffington Smith, D.S.O., Adjutant of the Corps, conducted General Oliphant and staff to Caterham to inspect the barracks there.

On Friday, the 15th, Lieutenant-Colonel Mayhew, Commanding Officer of the Corps, drove General Lord Grenfell, G.C.B., etc., and staff to Gravesend for his inspection of the forts.

Mr. E. Midgley a well-known member of the Automobile Club, has been recommended for appointment as an officer in the Motor Volunteer Corps.

PARIS-MADRID.

Departure of Jaureitz.—In the centre is the Marquis De Dion with his favourite poodle.

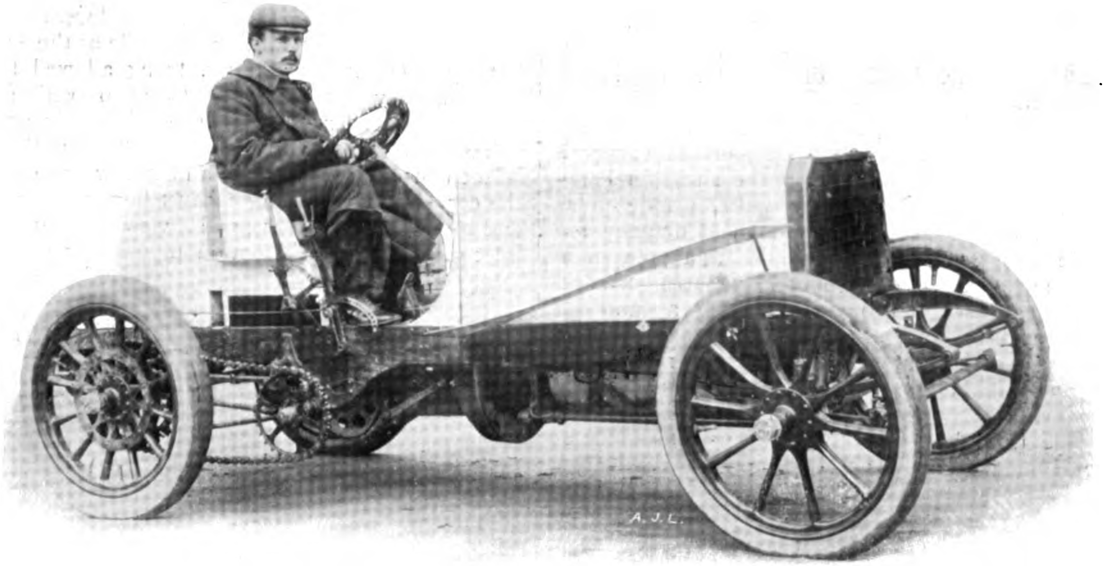


One of the De Dietrich Cars starting from the A.C. de France Club House.

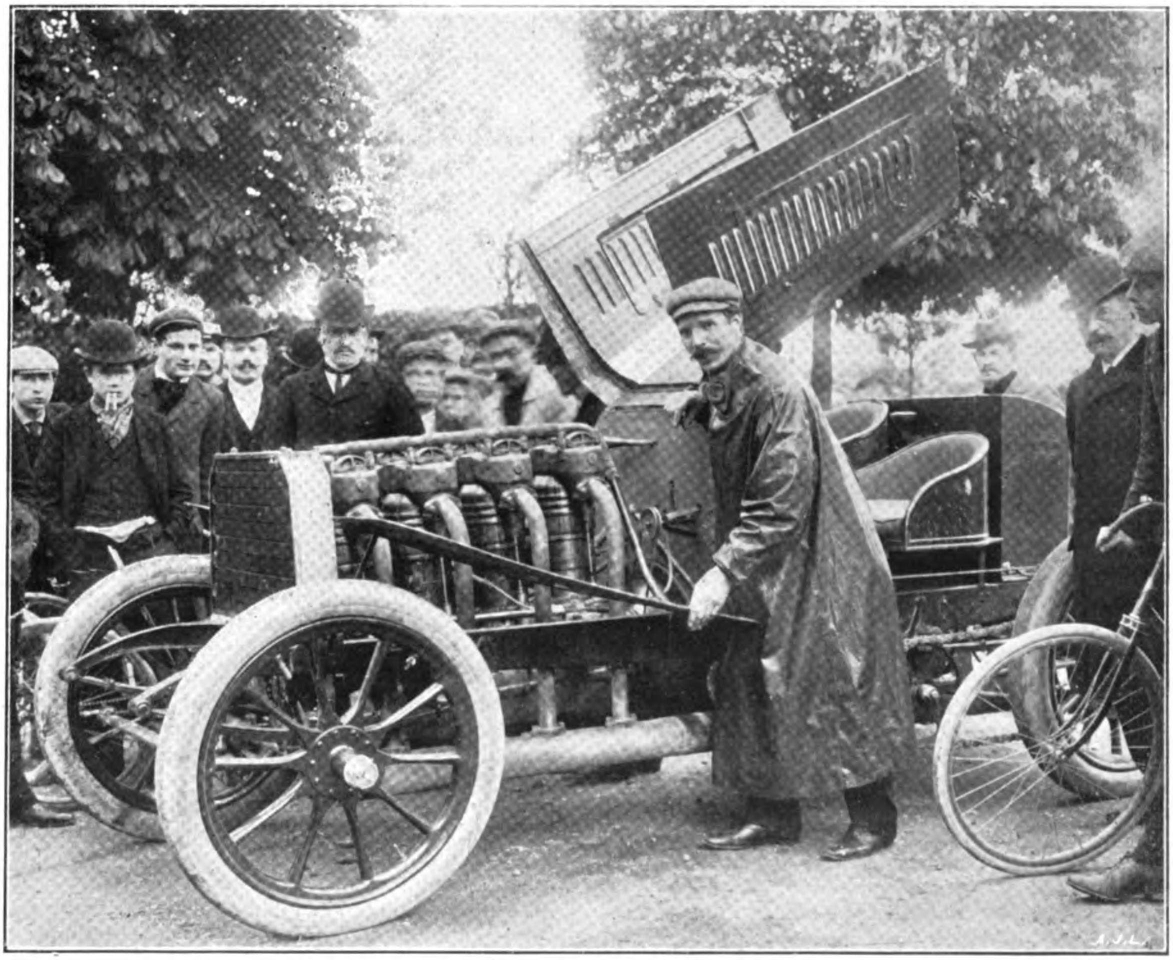
Paris-Madrid Race.—The Tourist Section.

THE tourist cars which started last week are quietly jogging along, covering their 100 to 220 kilometres per day, and will ultimately arrive next Tuesday, the 26th instant, at Madrid, the day before the racers, which start to-morrow (Sunday), at 3.30 a.m. Reports to hand, of the tourists, point to no special incidents of consequence, and the fact that the rules do not compel the cars in most stages to cover any particular section of the road in any special time detracts very largely from the general effect which a large number of the cars travelling *en masse* would have. The last few days' run through Spanish territory, however, will have to be more strictly observed, no doubt with the object of leaving a lasting impression upon the Spanish people in the districts through which the cars will have to pass. We reproduce a few photographs, taken at the start of the tourist cars from the magnificent Club premises of the A. C. de France in the Place de la Concorde.

In the Racing Section all the elaborate details are now being perfected, the weighing up and all other formalities, as we announced last week, having started last Tuesday, and, according to the rules, should have been completed by Friday of this week. When the list of entries closed last Friday night at 6 o'clock 314 engagements had been received. Upon examination, 36 of these, it was found, had not complied fully with the conditions laid down, and therefore their entries were cancelled, this leaving 278 probable starters, a record for any event hitherto held. The 278 are comprised of 112 heavy cars, 66 light cars, 40 voiturettes, and 60 motor cycles. Amongst the list of chauffeurs it is curious to notice what a very large number of the crack drivers have been drawn from famous old cycle riders, and those who have followed the automobile movement for the last seven or eight years can easily trace the stages through which these men of iron nerves have passed, commencing with the lowest powered machines and gradually working up to the giants of to-day. Most of the present men have thus served their apprenticeship, starting with the motor tricycle and passing to the voiturette, light car, on to the heavy vehicle until the present list of fearless drivers has lengthened out to a formidable extent. The drivers who have had the good luck to draw a position amongst the first dozen starters may indeed consider themselves fortunate should the roads be heavily laden with dust, although in the face of the announcement that the larger cars will be sent off first, the light cars second, and last the motor cycles in pairs, hardly gives the smaller fry the benefit to which they are apparently entitled as the result of the ballot for places. These first twelve good men and true are:—1, Charles Jarrott (De Dietrich car); 2, Ch. Rene de Knyff (Panhard car); 3, Louis Renault (Renault light car); 4, Thery (Decauville light car); 5, Loraine Barrow (De Dietrich car); 6, Haustgen (Haustgen motor bicycle); 7, H. Fournier (Mors car); 8, Braiser (Georges Richard light car); 9, A. S. Harkness (Harkness car); 10, Teste (Outhenin-Chalandre car); 11, Thellier Passy (Thellier voiturette); 12, J. J. Mann (Hotschkiss car). Amongst the other entrants No. 14 falls to Werner on a Mercedes car; 17, to H. R. Kirk on a Napier; 22, to Girling on Lieut. Smith-Cumming's Wolseley; 34, De Grey (Mercedes); 35, Chaboche (Chaboche); 36, Hieronymus (Mercedes); 38, Maurice Farman (Panhard); 51, H. Farman (Panhard). Both these gentlemen and their cars are seen in our photographs which we reproduce this week. No. 53 is Charron on a C.G.V.; 59, the Hon. C. S. Rolls on a Panhard; 60, J. K. Vanderbilt on a Mors; 64, Tod Sloan (Georges-Richard); 68, Baron de Forest (Mors); 78, Baron de Crawhez (Panhard); 84, E. H. Arnott (Werner bicycle); 86, Jenatzy (Mercedes); 89, S. F. Edge's Napier; 99, J. B. Warden (Panhard); 114, Foxhall Keene (Mercedes); 119, Le Blon (Serpollet); 138, Mark Mayhew (Napier); 151, Osmont (Darracq); 185, Osier (Mors); 205, A. Fournier (Mors); 216, E. Hutton (Panhard); 227, J. Holder, accompanied by Mr. T. C. Aveling (Panhard); 255, Harvey Foster (Wolseley); 241,



Maurice Farman on his new 85-h.p. Paris-Madrid Panhard Racer.



Henry Farman, who is one of the drivers chosen to represent France in the Gordon-Bennett Race, and his new 85 h.p. Paris-Madrid Panhard Racer.

F. Jackson (Eagle Engineering Company). Lord Carnarvon is also in the list with No. 256, and Mr. Arthur du Cros, No. 261. Mdme. du Gast drives a torpedo-shaped 35-h.p. De Dietrich.

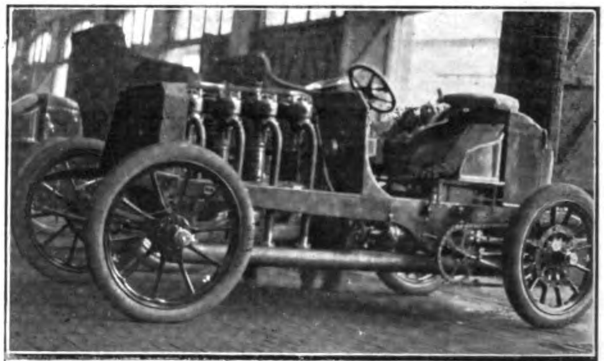
The extraordinary scenes which will be witnessed from the Saturday night until after the start of the cars will probably surpass even what was seen at the starts for Paris-Berlin and Paris-Vienna in previous years, wonderful as those were. The Messageries Automobile Company are sending a De Dion-Bouton steam omnibus to a point near Ablis. There will be room for about sixty passengers, and a special inducement offered to patrons is that a stand will be taken up "at discretion" where the "emotions" may be stirred better by seeing the cars pass at about 140 kiloms. per hour, or at a right angle turn where numerous accidents are practically guaranteed as part of the bargain. On the first stage from Versailles to Bordeaux, a distance of 362½ miles, some extremely fast times may be anticipated, as the French roads are in magnificent condition, and the great increase of engine power this year will probably lead to some revelations in regard to speed on the straight flat. The present record between the two points is 6 hours 11 mins.

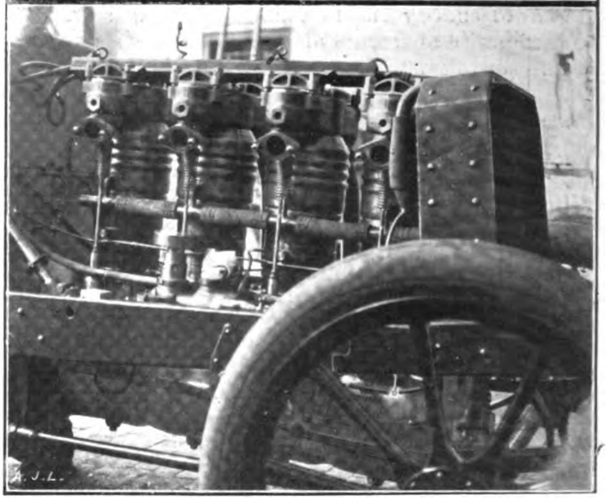
Paris-Madrid Tourist Section.—Mdme. Clarke, one of the lady entrants (No. 28), on her 24-h.p. Renault Car.

In Spain every effort is being made to ensure the race being a success. The Duke de Santo Mauro is and has been working ceaselessly to this end. The roads are to be kept rigorously clear of both cars and horse-drawn traffic, from 5 a.m. to 8 p.m. on the days of the race, viz., on the 26th from Behobie to Vittoria, and on the 27th Vittoria to Madrid. Elaborate preparations in Madrid, only equalled in the case of some important bull fight, are being made to greet competitors and generally fête them as heroes. Banquets and entertainments by the score are arranged, in addition to excursions, special theatre performances, and other amusements, so that those who are able to remain in the Spanish capital to indulge in the festivities offered will probably have an experience they are hardly likely to forget during their lifetime. The enthusiasm throughout the Peninsula has never been equalled by any previous event.

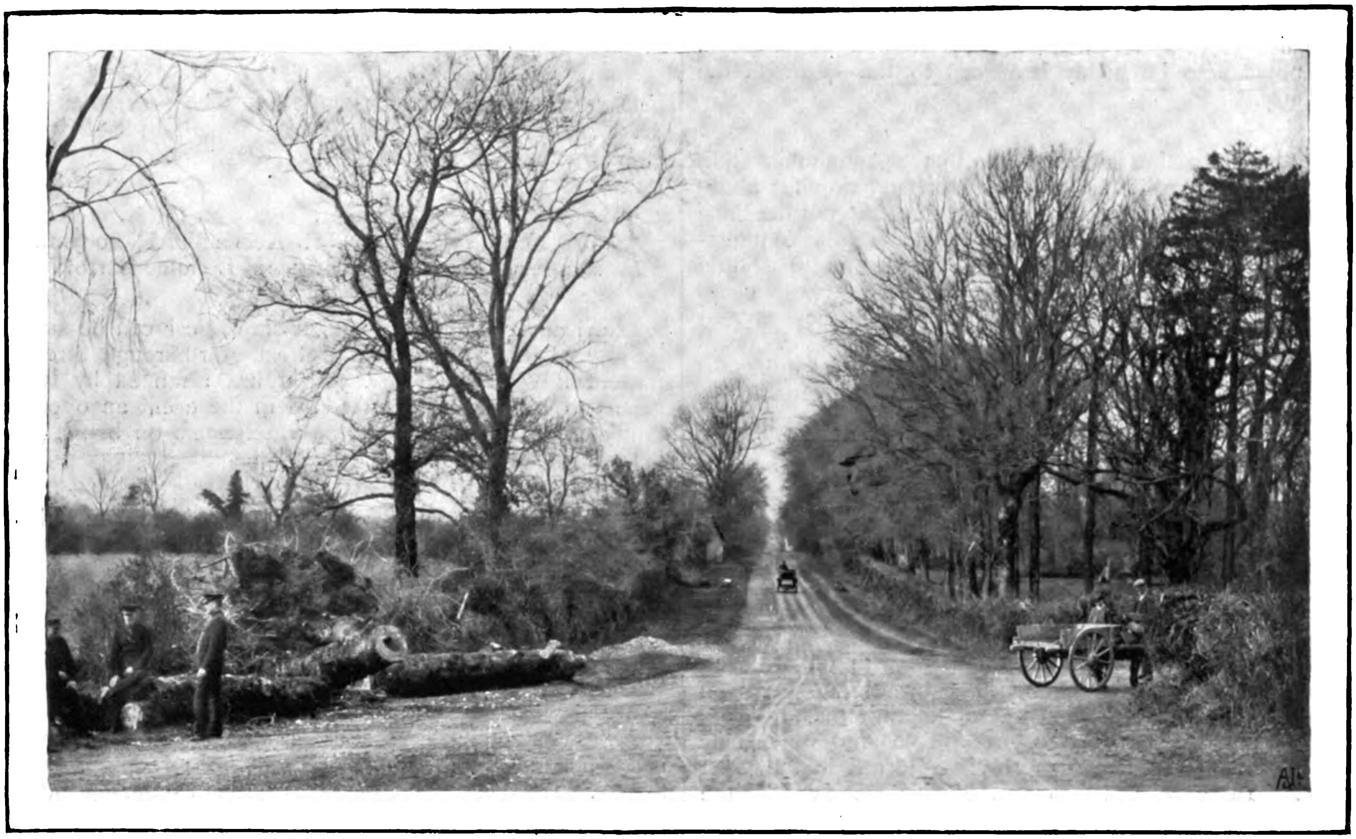
Several of the cars will use alcohol as fuel, notably De Knyff (No. 2, Panhard), Juvanon (No. 24, Rochet Schneider), Barras (No. 47, Darracq), Taveneaux (No. 70, Gobron-Brillié). The closeness of the weight of many of the cars to the maximum of 1,000 kilogs. is very remarkable, quite a number turning the scale at the exact weight, but by a credit of 7 kilogs. being allowed for magnetic ignition, they managed just to keep within the limit. Degrais' Mercedes (No. 34) weighed exactly 1,007 kilogs.

THE general appearance of the 85-h.p. Panhard racers is seen in our illustrations, and below we give a view of the car, showing the long exhaust box, which extends from end to end of the chassis, and a view of the engine from the inlet valve side, the induction pipe being removed. This car has a stamped steel frame, and an unusually long wheel base. The engine has four separate steel cylinders, with corrugated sheet metal jackets soldered to them. The mechanically-operated inlet valves are arranged on the opposite side to the exhaust valves, and a Krebs carburettor is employed. The radiator is not of the honeycomb type, although the coiled and finned tubes forming it are enclosed in a casing which make it resemble one in outward appearance; the engine is inclined slightly forward, so that the front end of the crank-shaft is lower than the other end. Sufficient clearance is thus obtained for the large flywheel, and yet the weight is kept as low as possible; the flywheel is of considerable size in order to provide a large clutch surface. The gear-box is arranged so that the differential countershaft lies across its forward end, and it affords three speeds and a reverse. The position of the driver's seat is well shown in our illustrations; the tanks are arranged beneath it. A speed of about 80 miles per hour is anticipated, and the actual h.p. available is variously stated at between 85 and 100 h.p.





THE GORDON-BENNETT RACE AND IRISH FORTNIGHT.



(*Photo by Lawrence, Dublin.*)

The Gordon-Bennett Cup Course.—Ballyshannon cross roads, about one mile from the starting and finishing point. The road where the donkey cart is standing is a near cut for spectators to the course near Kildare. Where the Irish Constabulary are standing the road leads by a short way to Old Kilcullen Road.

Mr. J. Ernest Hutton has written a letter to the automobile press generally, pointing out that, unless adequate steps are taken to avert such a contingency, there is a danger of the occurrence during the Irish Fortnight, and subsequently in that island, of what the writer terms "the terrible calamity of a petrol famine." He estimates that 60,000 gallons, that is to say about 250 tons of petrol, will probably be consumed during the month of July. He himself intends to consume between 200 and 300 gallons. We are pleased, therefore, to be able to announce that the Anglo-American Oil Company (Limited) inform us that they are organising a large number of agencies for the supply of motor spirit at all the principal points which automobilists are likely to visit during the Irish Fortnight, and at a large number of villages and small towns as well. The Company anticipate being fully able to meet any possible demand which may arise. It is satisfactory to know, in view of recent complaints on the subject, and particularly as there will be a large number of foreign cars present, that for the Irish Fortnight the Anglo-American Oil Company are guaranteeing to supply spirit of a density of ·685. They will also supply spirit of a density of ·700 for those who like it, but they are not intending to ship any spirit to Ireland of a higher density than the latter. It is satisfactory to learn that the great Company are thus rising to the emergency, and recognising the importance of the Irish Fortnight for the future of the automobile industry in these islands.

Complaints continue to come in as to the ridiculously exaggerated ideas from which the Irish peasantry appear to be suffering as regards the price which they are likely to obtain even for permission to camp out in their fields. Of course the Irish countryman is largely accustomed to pay his rent from windfalls, even if these take the rather arduous form of coming over to Great Britain and working during the summer months at the harvest, so that it is only to be anticipated that he will endeavour to make the most of the opportunity afforded by the Irish Fortnight. At the same time, as things appear to go at present, there is a distinct possibility of Patrick killing the goose that lays the golden eggs. If visitors, particularly cyclists, who are not always of the monied class, are to be charged several pounds for the permission merely to camp out in fields, they will go back quicker than they came. Even in the case of car owners, who do not usually stick at reasonable expenditure, though they may put up with extortion at the time of the Race and during the Fortnight, the effect of this sort of thing cannot but prejudice the future of the country as far as automobilism is concerned. We trust that those who have local influence in Ireland, and a somewhat wider view than the peasantry can be expected to entertain, will use their influence to prevent the people, by an unreasonable display of avarice, from interfering with what at present promises to be a movement which, if allowed proper scope, cannot fail to be highly beneficial to the future of the country.

VIGOROUS action is being taken by the Automobile Club to provide dining and sleeping accommodation for about 500 visitors near Kilcullen for about three days of the Race week. Messrs. Gamage and Co., of Holborn, have undertaken to erect at least 100 tents, forming quite a little village under canvas. These will be equipped with camp furniture, cooking utensils, and everything necessary, in reason, for the occasion. Mr. Max Muller, one of Dr. Lunn's right-hand assistants in connection with his camping-out trips in Palestine, will superintend the arrangements of the camp. The idea is splendidly conceived, and should not only prove of enormous convenience to a number of visitors, but will probably be a source of considerable pleasure, provided the Clerk of the Weather is kind.

THE NAPIER COMPANY, with the usual enterprise always displayed by Mr. Edge, are evidently bent on doing their best to retain the cup for another year, and are indeed showing themselves to be worthy representatives of the industry of this country. Not content with relying upon the racing cars, already described by us, of the type which recently took part in the eliminating trials, they are completing two much more powerful vehicles which may be driven by Mr. Edge and by Mr. Jarrott in the great race. In general respects the arrangement of the mechanism is the same as in the smaller cars, three forward speeds being provided, and a direct drive to the live axle being secured when on the top speed. The engines give about 110-h.p., so that these vehicles will be amongst the most powerful which have as yet been constructed by any firm. In order to get sufficient weight for adhesion on the driving wheels, the engines are fixed considerably further back than usual, being actually behind the front springs instead of between them; the bonnet, in consequence, will be unusually long. The springs also have been lengthened considerably, and, needless to state, the wheel base, too, has been increased. The clutches which are employed on the Napier racers are of the cone type, and have been very carefully developed so as to make them certain in action, and yet not too "fierce." The friction surfaces on both members are of cast iron, and they are lubricated. The film of oil which is present between them at the moment of engagement prevents them from seizing too rapidly at that time, and a positive grip between them is only secured after the oil has been squeezed out by the pressure forcing them together. Quadruple inlet-valves of very neat design—and, of course, atmospherically operated—with very soft acting springs, have been fitted on the smaller racers. On these larger machines similar valves may be used, or it is possible that those having three concentric seats may be employed instead; both types are to be tried on the cars, and needless to state those that give the best results will be adopted. With regard to the multi- and concentric-seated valves, which we illustrated in our issue of 10th May, 1902, it is particularly interesting to notice that the Cannstatt Daimler Company have followed the Napier lead on their new Mercedes cars, and have once more acknowledged that in some respects, at any rate, Continental makers can usefully take a leaf now and then out of the books of British manufacturers.

CASTLE RHEBAN HOUSE, Athy, has been secured as the headquarters for Messrs. S. F. Edge, Charles Jarrott, and J. W. Stocks from the early part of next month.

THE latest drivers named to represent Germany in the race are Baron de Caters, Foxhall Keene and Hieronymus, with, as reserves, Degrais, Jenatzy and Lorraine Barrow.

MR. JARROTT'S Gordon-Bennett Napier car can be seen by any of our readers at 45, Great Marlborough Street, Regent Street, where Mr. Jarrott has arranged by this means to give all those interested in the event an opportunity of examining one of these defenders on behalf of Great Britain.

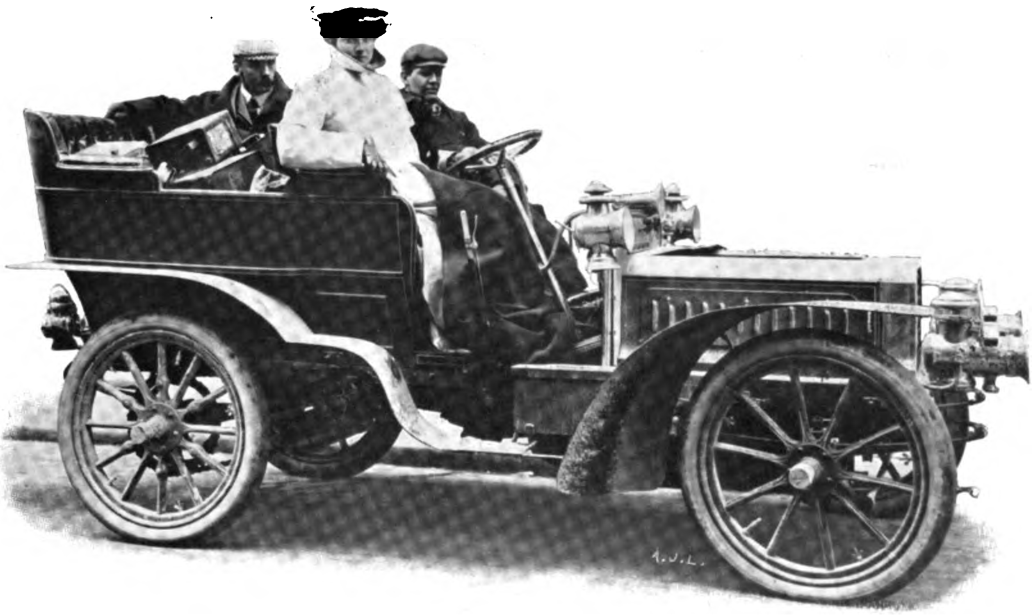
A SKELETON MAP of the course has been issued by Hutton, Sons, and Co., of Dublin, which they are sending free to all applicants. Useful information is also given in tabular form showing the miles of the various towns and villages from Dublin and the intermediate distances, the same information also being given for certain towns outside the circuit.

AN exceptionally clear and useful map of the race course is to hand from G. W. Bacon and Son, Limited, 127, Strand. It is based on the latest Ordnance Survey Map, and shows with the greatest distinctness the starting and finishing points, control areas, railways, dangerous hills, &c. In addition a key map from Londonderry down to the point of the course at Carlow shows at a glance the best roads for reaching the various points of the course. A brief description of the route accompanies the map.

* * *

AMERICAN politicians appear to appreciate the importance of the automobile for campaigning purposes as keenly as candidates for Parliamentary honours on this side of the pond. Orders are already being placed for vehicles for this purpose for next September's speech-making campaign, one of the vehicles being a huge electric truck, which will be used as a platform at street corner meetings.

WITH elaborate ceremonials the Louisiana Centennial Exposition was dedicated early this month. Great efforts are being made to ensure a huge display of automobiles both of American and foreign make, when the "Fair" opens next May, every facility being given by the authorities for this purpose. The use of a track for demonstration of cars will be provided, and it will be sought to make the automobiles a centre of attraction for visitors. France has already secured a large floor space, American builders have applied for about 100,000 square feet, and it is sincerely hoped that British makers will be adequately represented in this department through the British Commissioners. The space is free, and we are glad to note that the Society of Motor Manufacturers and Traders are moving in the matter amongst the trade.



Glasgow-London Non-stop Run.—Miss Dorothy Levitt on her 12-h.p. Gladiator Car immediately after the finish at the Automobile Club.

GLASGOW-LONDON NON-STOP RUN.

A **YEAR** ago we were eight, on this occasion we were twenty-nine. Probably the eight, in proportion to their number, made a bigger display, they certainly made more noise, as they lined up at Glasgow Cross about midnight, than was exhibited by the larger gathering in the secluded quiet of St. Vincent Street in the early morning of last Wednesday week. Not that we collected in stealthy quiet by any means. Some cars are not built that way, and as they drew up into position, snorting and gasping, they could be both heard and smelt. Three of the cars and two of the motor cycles entered did not take part in the run, but the total number given, consisting of twenty-two cars and seven cycles, assembled and left the starting point about half-past three o'clock. The writer was accommodated with a seat in No. 5, one of the 10-h.p. Lanchester cars, driven by Mr. E. J. Hartenfeld, and he congratulated himself on his luck on being placed on such a delightfully quiet and smooth-running machine, and on finding it in the charge of such a skilful driver. All the machines being assembled, a start was made rather before the fixed hour, the route by Tollcross, Hamilton, and Larkhall being followed, then on by Abingdon to Crawford Inn, the first control. Starting fifth, we must have passed Miss Levitt on the way, or she took an alternative route out of Glasgow, for on rising towards Hamilton, after crossing Bothwell Bridge, she passed at good speed, giving us a graceful hand wave as she went ahead. But the race is not always to the swift, and before Larkhall was reached the Gladiator was side-tracked for tyre repair, and, as Bunyan was wont to put it, "we saw saw her no more"—till next day. A control every forty miles or so, with cars running well up to the minimum time, means that they keep fairly well together, and although a good deal of sprinting on quiet stretches was indulged in, the knowledge that it must be followed by the inevitable crawl into control prevented its being carried to inconvenient excess.

Crawford Inn was reached at the breakneck speed of about two miles an hour; then on and away from Beattock Summit, and down into Annan Valley, through Lockerbie—famed for its lamb fair—Ecclefechan, where Carlyle was born and lies buried, to Gretna Green, and into Carlisle, in a bunch at tortoise speed. The day was grey and cold, and the cans of hot cocoa, considerately arranged by the Lanchester Company to be handed on board as we passed through Carlisle, was highly appreciated. At this time over a dozen cars were running in close company, off and on, from which it was to be assumed that no trouble had come their way. These were: No. 1, the 14-h.p. Chenard and Walker; No. 3, the 24-h.p. De Dietrich; No. 4 and 5, both 10-h.p., Lanchesters; No. 6, a 10-h.p. Wolseley (driven by M. Prosser); Nos. 8 and 9, two 12-h.p. Sunbeam cars; No. 15, a Rochet-Schneider; Nos. 17 and 18, two Georges Richards; Nos. 19 and 21, two Arrol-Johnstons; No. 22, a 10-h.p. Wolseley (driven by Mr. Shaw), and a 12-h.p. Argyll. Of these, the most steadily driven was probably the Rochet-Schneider, by Captain Deasy. Others might sprint and crawl, but this gentleman was content to keep going at a regular speed, which brought him to the control about the expiration of the minimum time.

Soon after leaving Carlisle the rise began, which culminated on the shoulder of Shap Fell, the highest point on the route, after which the cars had a splendid run down into Kendal. It says much for the modern automotor that it is capable of carrying a load of passengers over this hill, for it is not only a good climb, but the surface in some parts is very indifferent. From Kendal to Skipton the road went by Kirkby-Lonsdale and Settle. An intimation had been given that trouble with the police might be expected after passing the last named town, and the event justified the warning. To the unsophisticated writer the manner in which this warning was received, the lamb-like simplicity with which the drivers met the police tactics was a little amusing. It was known that trouble need not be expected before Settle was reached, and as that town is thirty miles from Kendal, it would have been wise to have covered that distance at good speed, and crawled the remainder of the control. In similar cases it would be well in future, I think, to permit the first driver caught to return and warn the others, without addition of time or loss of marks. As it was, at least half a dozen drivers were caught, and amongst them was Miss Levitt. That young lady had, however, in common with the other drivers, been warned by a placard carried by a gentleman in a carriage, and she asserts that her speed did not exceed seven miles an hour when stopped. Our car was stopped also, the charge being that it exceeded a speed of sixteen miles an hour over a measured quarter of a mile. I would have very great hesitation about calling in question a statement by a member of the Unimpeachable Veracity Force, and am prepared to admit that we may have been going at that unruly speed, but it is a little difficult to see exactly in what way we offended against the comfort, interests, or safety of others. The road was apparently deserted, and we were moving slower than stage coaches did in England seventy years ago, yet we were placed in the same category as the scorcher who tears with impunity through populous districts, indifferent alike to the convenience or welfare of others. Is the law blind, or is it only stupid?

Our companion Lanchester, No. 4, had been keeping us company, both cars running well, but between Skipton and Leeds we unfortunately made a detour, and in attempting to go about No. 4 got on the side walk, breaking its reversing gear, whereupon it was withdrawn. The detour added twenty minutes to our running time, and it was consequently after four o'clock before we reached the Leeds garage. Here we found a considerable crowd in Great George Street, the coming of the cars having evidently been noised abroad. The contesting cars were evidently doing well, as few deductions of any consequence were reported. Wolseley No. 5 had lost a few marks from a commutator nut coming slack. Argyll No. 10 had also dropped marks for a puncture; No. 13, the Brooke tonneau, had been in trouble with its water, and was withdrawn; tyre trouble had caused the 12-h.p. Georges Richard to drop behind; the De Dion-Bouton had also lost marks, it was said, and as Mr. Stocks had gone on when we turned on the detour, he was somewhat later in turning up. In the evening we heard that the small Peugeot had experienced trouble with its ignition, but it turned up all right soon after six o'clock. The most curious cause of delay was that which stopped the 24-h.p. Georges Richard over three hours. By mistake the contents of a tin of water were poured into the petrol tank, and, of course, rendered the liquid useless. In the garage, nothing except the turning off of oil and petrol was permitted, and nothing in the form of repair, adjustment, or replenishing was permitted without loss of marks.

The Scottish Club officials were early on the scene on Thursday morning and had the cars pushed into their positions, which were decided by their time of arrival the night before, and a few minutes after six o'clock the nineteen cars and four cycles which reached Leeds within the maximum time—only one, the privately owned Argyll, No. 14, arrived outside of it—were on their way to Doncaster. Two cars lost a few minutes in starting however, the Gardner-Serpollet in getting up steam, and Argyll, No. 10, in starting the motor. The second day's run was extremely enjoyable, and but for the interference of the Nottinghamshire police, would have been uneventful. That section of the force exercises a little discretion, and although three traps were laid, in only two cases were cars stopped, Mr. Jarrott and Captain Deasy being the victims. The thanks of the contestants are due to Mr. Edge for travelling from London to Stamford to draw and expose these traps, and it was probably to his warning that the small number of victims was due. The Great North Road is a splendid course for such a trial in some respects, but it was much less exacting than the preceding day's route over the undulating South of Scotland and North of England—including Shap Fell—and it was to be expected that machines which came through the first day unscathed would scarcely succumb on the second, and so it proved. All got through with little or no loss of marks, and, although we again went astray when leaving Biggleswade for Hitchin, thereby adding a few minutes to our running time, and to those of others who kindly kept us unwilling company, most of the cars reached Piccadilly as well up to time (the minimum) as the average railway train. The Lanchester's minimum time for arrival was 5.24, and it reached its destination at 5.30, being fifteenth to arrive at that. Miss Levitt was again in trouble to a small extent, losing a minute and a half in changing accumulators, but her run, nevertheless, was uneventful, and she fully deserved the encomiums lavished on her when she drew up at the Club. She passed us about fifteen miles from London, bent apparently on making up time. On this stage Mr. Jarrott's De Dietrich also lost a minute or two. The smaller Georges Richard had again trouble with tyres, but turned up in good time. Bringing up the rear—naturally—was the small Peugeot, which had been detained somewhat by tyre trouble. These were the only stops made by nineteen cars during the second stage, if we except one or two of a trifling nature still under the consideration of the committee, and the record says much for the reliability of the modern automobile. The motor cycles which left Leeds also got through all right, a Quadrant, No. 3, without a stop, and the Brown and two Humbers without serious trouble.

The trial, which was undoubtedly a pronounced success, will have far-reaching effects in Scotland, and as it attracted much attention it cannot but make for good in England also.

Having travelled on one of the cars a year ago I was able to make comparisons between the effect produced by the passing cars then and now, and there can be no doubt that a very great improvement has taken place in the intervening twelve months. Horses and cattle have evidently become familiarised with the appearance and noise of the motor, and were much less nervous than a year ago, a remark which applies also to dogs and bipeds, both human and feathered.

A. F. S.

The cars which earned full marks and made non-stop runs are:—No. 5, 10-h.p. Lanchester; No. 8, 4-cylinder Sunbeam car; No. 9, 4-cylinder Sunbeam car; No. 19, Arrol-Johnston dogcart; No. 21, six-seated Arrol-Johnston car; No. 22, 10-h.p. Wolseley Tonneau; No. 23, 12-h.p. Argyll.

The following is a preliminary report issued by the Scottish Club. After several matters which, as mentioned, are still under consideration by the Committee have been decided, the detailed report and awards of certificates will be announced:—

1. 14-h.p. Chenard and Walcker Tonneau, entered by the Weston Motor Syndicate. Deduction of one mark for a driving stop. Four passengers.

2. 12-h.p. Gladiator, entered by Miss Dorothy E. Levitt. Stop for puncture, 20 mins.; stop for battery run down, replaced by spare, 1½ min. Three passengers.

3. 24-h.p. De Dietrich, entered by Charles Jarrott. Stop, owing to petrol not reaching carburettor, 7 mins.; engine stopped momentarily when enquiring route, 1 min.; stop owing to petrol not reaching carburettor, 2 mins. Three passengers.

4. 10-h.p. Lanchester, entered by Lanchester Engine Company, Limited. In reversing to return to rightward broke reverse gear, and gave up run between Skipton and Leeds. Four passengers.

5. 10-h.p. Lanchester, entered by Lanchester Engine Company, Limited. Non-stop. Full marks. Four passengers.

6. 10-h.p. Wolseley Tonneau, entered by Rennie and Prosser, Limited. Ignition stop, 4 mins. Glasgow to Leeds three, Leeds to London, four passengers.

7. Darracq Tonneau, entered by William H. Kingsbury. Did not start from Glasgow.

8. 4-cylinder Sunbeam car, entered by John Marston, Limited. Non-stop. Full marks. Four passengers.

9. 4-cylinder Sunbeam car, entered by John Marston, Limited. Non-stop. Full marks. Four passengers.

10. 10-h.p. Argyll, entered by the Hozier Engineering Company, Limited. Puncture stop, 15 mins., delay in re-starting engine at Leeds, 3 mins. Three passengers.

11. Six-seated double phaeton (Gardner-Serpollet steam), entered by Middleton and Townsend. Non-stop. Six marks will be deducted for getting up steam at Leeds. Four passengers.

12. Tonneau car, entered by J. R. Richardson and Co. (Lincoln), Limited. Did not start for Glasgow.

13. 3-cylinder Brooke Tonneau, entered by Frank F. Wellington, Limited. Stopped for broken speed-lever fork 45 mins. and 2½ hours to replace pump, and was withdrawn at Kendal. Report not yet received. Three passengers.

14. 9-h.p. Argyll entered by Henry B. Hemmons. Car withdrawn during the trial. No records received.

15. Rochet and Schneider, entered by Captain H. H. P. Deasy. Driving stop 1 min. Four passengers.

16. Delahaye Tonneau, entered by Delahaye Chief Depôt. Did not start.

17. 12-h.p. Georges Richard light car, entered by Mann and Overtons, Limited. Tyre stop, 20 mins.; tyre pumped in Leeds, 2 mins.; puncture, 12 mins.; puncture, 12 mins. Three passengers.

18. 24-h.p. Georges Richard light car, entered by Mann and Overtons, Limited. One petrol tin containing water by mistake was emptied into tank and caused stoppage of 3 hrs. 12 mins. Four passengers.

19. Arrol-Johnston, dogcart, entered by Mo-Car Syndicate, Limited. Non-stop. Full marks. Three passengers.

20. 10-h.p. De Dion-Bouton, entered by J. W. Stocks. To fill tank two minutes, to replace plug one minute. Three passengers.

21. Six-seated Arrol-Johnston carriage, entered by the Mo-Car Syndicate, Limited. Non-stop. Full marks. Four passengers.

22. 10-h.p. Wolseley Tonneau, entered by Thomas Shaw. Non-stop. Full marks. Four passengers.

23. 12-h.p. Argyll, entered by Hozier Engineering Company, Limited. Non-stop. Full marks. Three passengers.

24. Peugeot, two seated, entered by Glasgow Motor Company. Stop for ignition, 3 mins.; stop for ignition, 2 mins.; stop for ignition, 3 mins.; puncture, 15 mins.; stop for ignition, 1 min.; replaced one trembler. Two passengers.

25. F. A. C. Tonneau, entered by Farman Automobile Company, Limited. Has been disqualified.

BICYCLES.

1. Motor bicycle, entered by the Triumph Cycle Company, Limited. Did not arrive at Leeds. No records received from driver.

2. Motor bicycle, entered by the Triumph Cycle Company, Limited. Wired from Kirkby-Lonsdale, "Stuck." No further driver's report received.

3. Motor bicycle, entered by Quadrant Cycle Company, Limited. Non-stop.

4. Motor bicycle, entered by Weller Brothers, Limited. Did not start.

5. Motor bicycle, entered by Weller Brothers, Limited. Did not start.

6. Motor bicycle, entered by Ariel Company, Limited. Wired from Preston Station, "Have abandoned run." No further driver's report received.

7. Motor bicycle, entered by Brown Brothers, Limited. Filled tank twice, pushed up Shap Hill, pushed up hill near Kirkby-Lonsdale, stopped to lubricate, stopped to replace belt three times, stopped to adjust trembler.

8. Motor bicycle, entered by Humber, Limited. Stopped to fill with petrol five miles from Leeds and in Leeds, stopped near Biggleswade to fasten plug.

9. Motor bicycle, entered by Humber, Limited. Stopped fifteen minutes at Welwyn to clean out carburettor, stopped two minutes for loose terminal.

It is believed that no motor cycle came through without pedalling, but no marks are deducted and no comments made.

We have received a letter from Mr. A. E. Hodgson, of the Chief British Depôt, with regard to the 12-h.p. Gardner-Serpollet car which was driven so successfully by Mr. Townsend in the Glasgow to London Non-stop Durability Trial. He points out that although Messrs. Middleton and Townsend omitted to state that it was an English-built car, that it was constructed entirely at the English works, every part of it being standardised to English threads and gauges. He justly draws attention to the fact that the performance speaks volumes for the reliability of the English Serpollet cars now made, and mentions the fact that all four wheels were shod with solid tyres; the car fully loaded weighed over two tons, in spite of which it made an absolute "non-stop" run for the 402 miles. He also mentions that these cars have only taken part in two competitions—the London to Oxford and the Glasgow to London—and in both cases they have earned official certificates.

HILL-CLIMBING COMPETITION AT SHEFFIELD.

THE first hill-climbing competition organised by the Sheffield and District Automobile Club was held on Saturday last, the hill selected being the Padley Wood Hill, which is near Grindleford Station, and is about seven miles out from Sheffield. The competition was for two challenge cups, one for cars and the other for cycles, which have been offered by the President of the club, Mr. Harvey Foster, and are to be competed for twice a year. The events are open to members only, and their cars are to be driven by themselves. The cups remain the property of any member who may win three consecutive events in the same class, the winner, in addition, on each occasion, receiving a medal, presented by the President.

Twenty-five cars and eighteen cycles were entered, of which the majority put in an appearance.

The weather, unfortunately, was far from being propitious for such an event, heavy showers being experienced at intervals throughout the day, and the roads being in a very heavy and greasy condition. In spite of the weather, however, the members of the club turned out in considerable force, and a great deal of interest was evinced in the neighbourhood. We were particularly pleased to notice that the club had the very hearty support of the police, and, in fact, that the constables who were on duty on the hill not only entered into the spirit of the event, but evidently considered their duty to lie more in the direction of keeping the road clear of horses, stray cattle, and slow moving carts than of interfering in the smallest degree with the competitors. Sheffield automobilists are indeed to be congratulated upon the attitude adopted towards them by the custodians of the law in their neighbourhood.

A seat had kindly been placed at our disposal by Mr. P. W. Fawcett on his 12 h.p. Humber, and we have to thank him for having afforded us such an excellent opportunity for witnessing the trials, in which he was a successful competitor. Running out from Sheffield about mid-day, the town, with its slippery streets and treacherous tram lines, was soon left behind and the high ground and the country reached. The neighbourhood is, indeed, a suitable one for hill-climbing competitions, being absolutely mountainous in comparison with the London district. For a few miles out the roads are of a granite character, but before Grindleford is reached the granite gives way to limestone—and to very decided "skidiness." It is not by any means a neighbourhood for high speeds, especially at this time of year, for the roads are far from level, and have a way of winding about which would render them particularly dangerous to drivers of the kind who have done so much to foster public prejudice against motorists in certain parts, and who are alone responsible for the strong feeling which exists in favour of identification. Without attempting to discriminate between cause and effect, we were a good deal struck with the skilful driving shown by the members of the club.

On arrival at Grindleford Station, we found a large number of cars and cycles already there, and other arrivals soon added to the gathering. The vehicles were then weighed without passengers, and *al fresco* luncheons, which by that time were very acceptable, were indulged in. The officials, meanwhile, and particularly the indefatigable secretary, Mr. J. R. Wade, on his little 2-cylinder Pieper voiturette, were, as usual on these occasions, kept fully busy, and must at times have cast envious eyes on those wearing less highly-coloured rosettes, or none at all, who were, therefore, comparatively free from care and responsibility.

It was not long before the competitors had drawn up in line on the further side of Grindleford Bridge, which crosses over the river at the foot of the hill, where they made quite an imposing array. From here they were started off in the order of arrival, with a three-minute interval between each, their time being taken as, with a flying start, they passed the first white flag. The hill is nearly a mile and a half long, and the average gradient throughout is about 1 in 17. It is by no means straight, and, particularly at the bottom, it twists and turns about considerably. So that although it was termed a flying start, yet it was only nominally so, for it was impossible to obtain any high rate of speed before commencing the ascent. In some places the gradient is extremely stiff, and these parts, combined with the corners and the heavy state of the roads, made the trial a very severe one. Taking it all round, as will be shown from the results which we publish, the cars did very well. The motor tricycles were particularly speedy, but on the other hand, none of the motor bicycles succeeded in making the ascent, the roads proving too slippery for them; the observers, who were posted at intervals along the road in order to see that no pedalling was indulged in, had a somewhat long and uninteresting wait in the rain before the news was passed along to and by them that it was useless to wait longer. Mr. J. Hoyle Smith, the Hon. Sec. of the Manchester Automobile Club, who came over by road on one of the 14-h.p. Belsize cars made by his firm, acted as umpire, and was stationed with the white flag at the top of the hill, accompanied by the time-keepers. After the cars had all made their journeys up the hill an interval of half an hour was allowed to permit those of them who wished to do so to descend. The tricycles were then despatched from the bottom, and another interval provided for their descent before the bicyles were given the word to go.

The formulæ adopted were those suggested by the A.C.G.B.I. for the forthcoming reliability trials in September, viz.:—

Hill climbing—

$$\text{Marks} = \left.\frac{3300}{\text{No. of hills}}\right\} \times \frac{(6 \times \text{No. of pass.})}{1500 + \pounds} \times 5{\cdot}87 \times \text{speed in m.p.h.}$$

Accuracy of advertised h.p.—

$$\text{Marks} = 250 \times \left(\frac{140}{100} \times \frac{\text{h.p. performance}}{\text{h.p. declared}}\right)^{3}, \text{ with a maximum of } 250.$$

Where h.p. performance

$$= \frac{(\text{laden weight, lbs.} \times 461) + (7{,}850 \times 35 \text{ lbs. per ton laden weight.})}{33000 \times \text{time, minutes.}}$$

It will be noticed that the cost price of the car is taken into account, and the marks allotted are discounted accordingly. The number of passengers also, diluted by the addition of the figure 6 to the actual number, form a factor on the credit side of the formulæ. The figure 5·87 represents the average grade per cent., and the 3300 is merely a constant. The h.p. shown by performance was ascertained in order that marks could be given for the "accuracy of advertised h.p." It should be pointed out, however, that 35 lbs. per ton was taken as the drawbar pull required for the road-surface, and that this, under the conditions which prevailed, must have been far from a correct figure, it being certain that this is a long way below the mark—50 to 70 being probably much nearer to it. The weight laden was ascertained by assuming the weight of each passenger as being 10 stone, and adding the weight thus arrived at to the weight of the car itself. From this formula, also, it will be noticed that the vertical height of the hill is 461 ft., and that its length measured along its surface is 7,850 ft. This may hardly perhaps be the right place to again enter the protest which we made in October last (after the 650 miles Reliability Trial), but we do think it a very great mistake to allow the cost price of the vehicle to enter in any way into a hill-climbing formula.

It was hoped that the sensation of the day would have been afforded by Mr. B. H. Foster's 50-h.p. Wolseley racer, as this was amongst the entrants; unfortunately, however, it was unable to put in an appearance.

The majority of the vehicles were of comparatively small size and low power, and most of them were, as will be seen, of well-known types.

Steam was represented by one Locomobile, and the remainder were petrol vehicles. Several 10-h.p. Wolseleys, and one of 7½-h.p., were there; we noticed that one of the former had an unusually long wheelbase. One or two old-timers were met with in the neighbourhood, and, indeed, one of the apparently everlasting original Daimlers took part successfully with the younger cars, which are really its direct descendants.

Mr. Fawcett's Humber was the only car which had a 4-cylinder engine, and very nicely it ran, too, in spite of some trouble with unsuitable petrol during the earlier part of the day. He has added many improvements to the machine himself, amongst which the substitution of throttle-governing instead of governing on the exhaust is the most noticeable. The car was remarkably quiet, and there was practically no vibration,

Two new types of car took part in the trials, the one being the "Norfolk," which is made by Mr. J. R. Wade's firm, and was driven by his partner, Mr. J. Cook, and the other was the "Hallamshire," manufactured by Durham, Churchill and Co. The Norfolk car has a twin cylinder 10-h.p. motor, and the vehicle is in many ways reminiscent of the Durkopp build. The crank-shaft is built up with three flywheels which are enclosed in the crank chamber; the circulating pump is mounted on the crank chamber, and is driven by spur gearing in the same way as on the Durkopp. The change-speed-gear gives three speeds and a "reverse," which are all controlled by a single side lever. The rear wheels are driven by side chains. The chief novel feature is that a throttle-valve, which is controlled by hand, and is independent of that controlled by the governor, admits cold air to the cylinder as it cuts off the supply of mixture from the carburettor, thus primarily diluting the mixture, and also cooling the cylinders when the valve is closed. The body is made entirely of aluminium, and it is also built by the firm. The wings, too, are of aluminium, and special rolls have been laid down for giving them the same appearance as an ordinary leather wing. A "Loyal" radiator is used, and it forms the front of the bonnet. The car is fitted with a tonneau body, and has a light and neat appearance.

In the latest "Hallamshire" model a twin-cylinder 10-h.p. motor is used, and the power is transmitted through the gear-box and a longitudinal shaft to a live-rear-axle. The company have ceased to use the "Champion" friction clutches which have hitherto formed a feature of their cars, and the vehicle now follows very closely on the lines of other well-known types. A direct-through drive is obtained on the top speed, and the rear wheels are fitted with internal brake-drums; these drums are turned on the outside so that additional band brakes can also be fitted if desired. Mr. F. R. Churchill's car had an unusually wide tonneau, which gave the body a peculiar appearance, with its somewhat bulging sides.

After the trials had been concluded tea was provided at the Maynard Arms Hotel, near by, where the members and their friends assembled, and completed a very enjoyable day before making their way back to Sheffield. The club, the committee, and the officials are to be congratulated on the success of this, the first of their hill-climbing contests.

Marks awarded for Hill-climbing (only).

Order.	Owner.	H.P.	Car.	Marks.
1.	H. Cooper	10	Wolseley	963
2.	F. G. Smith	4½	Locomobile	870
3.	Jas. Barber	12	Belsize	856
4.	A. Truelove	12	Belsize	854
5.	J. H. Pickford	10	Wolseley	787
6.	H. F. Hobson	3½	Century	778
7.	W. N. Drew	7½	Wolseley	757
8.	P. W. Fawcett	12	Humber	658
9*a*.	F. Churchill	10	Hallamshire	623
9*b*.	T. G. Revill	6½	Boyer	623
10.	P. R. Thompson	8	M.M.C.	572
11.	B. Hind	9	Clement	551
12.	J. Ellis	8	M.M.C.	405
13.	T. J. Fryer	8	Hozier	338
14.	J. Cooke	10	Norfolk	*
15.	W. Watt	6	Humber	†
16.	A. J. Blyde	3½	De Dion	‡

* Lubricating pipe choked. † Ignition failed.
‡ Carburettor froze.

The full detailed results are not obtainable before we go to press, and will therefore be given by us next week. It will be interesting to notice how the formulæ adopted work in practice.

PROPOSED PARLIAMENTARY BILLS.

The Revised Bill of the Automobile Club in charge of Mr. John Scott-Montagu, M.P.

For convenience of comparison the additions and alterations are shown in italics. We published the first draft Bill on May 2nd.

1.—After the commencement of this Act any person driving or in charge of a vehicle as herein defined on a public highway shall, unless some person is registered as owner thereof and unless such vehicle bears thereon a number or such other mark of identification as may be prescribed, be guilty of an offence punishable summarily.

2.—In addition to the powers conferred by the Locomotives on Highways Act, 1896 (hereinafter called the principal Act), and notwithstanding anything in the said Act contained, the Local Government Board may make regulations—

(1) Prescribing the conditions under which and the mode in which and the places where the registration and numbering or other means of identification of such vehicles may be effected and *where* the persons *owning such vehicles may be registered.*

(2) Fixing a sum not exceeding *five shillings* for each vehicle which shall be charged and paid to the County Council in whose district the licence is granted as duty or licence in respect of such registration and which duty shall be levied and dealt with as the additional duty imposed by the principal Act, such licence money to be applied in aid of the Highway Fund of such County Council.

3.—The person proceeded against for breach of any byelaw or regulation made under this or the principal Act or of any provision of such Acts may appeal to a Judge of the King's Bench Division of the High Court of Justice.

4.—"Vehicle" shall mean and include any vehicle referred to as light locomotives in the principal Act *or as may be hereafter defined by the Local Government Board*, as well as any vehicle propelled by mechanical power if it is designed to carry its load upon its own platform, and does not exceed, including such load, a total moving weight of *fourteen tons*, or when used for the purpose of drawing one vehicle does not exceed a joint total moving weight of *twenty tons.*

5.—The speed at which a light locomotive may be travelling shall not, irrespective of the other circumstances of the case, be a ground for taking proceedings or imposing fines or penalties *under this or any previous Act* against the owner or person in charge thereof.

6.—*Every person employed for pecuniary remuneration to drive a light locomotive shall take out a licence. Such licence may be suspended for any period not exceeding six months for breaches of this or the principal Act.*

7.—*Any such person driving a light locomotive without such a licence shall on summary conviction be liable to a fine not exceeding forty shillings.*

8.—*Police constable within the meaning of this and the principal Act, or any Regulations under the same, shall mean a police constable in uniform.*

9.—*In any case in which the number or such other mark of identification hereinbefore referred to is made use of for the purpose of a prosecution the prosecutor or informant shall prove that proper means had been taken at the time that the alleged offence was committed to notify to the person so prosecuted that he was required to stop, and such evidence must be confirmed in some material particular. In default of which any person or persons instituting a prosecution or laying the information under the Acts aforesaid shall pay any costs and expenses incurred by the person so prosecuted.*

10.—*If it shall be proved at the hearing of a prosecution that the person instituting the proceedings has done so against the wrong person by reason of mistaking the number of the vehicle he shall pay any costs and expenses incurred by the person so prosecuted.*

11.—The Locomotives on Highways Act, 1896, is to be read as one with this Act, except section four, which is hereby repealed, except in the case of vehicles of a weight unladen exceeding *three* tons.

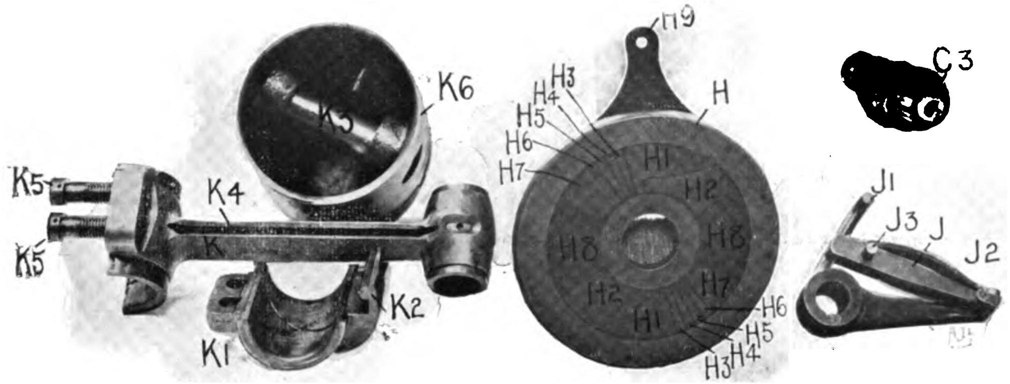
12.—This Act may be cited as the Locomotives on Highways Act, 1903, and shall come into operation on the first day of January, nineteen hundred and four.

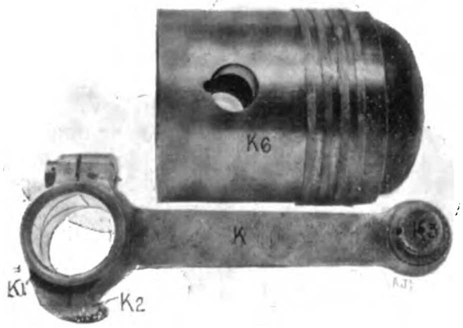
On Monday last about 70 new members were up for election to the Automobile Club. Amongst these were the Earls of Buckingham, Clonmell, and Cottenham, His Highness Nripendra Narayan Bhup, Maharaja of Cooch Behar, His Highness Aga Khan, Mr. C. D. Rose, M.P., Major F. W. Bradley-Dyne, Bart., Capt. John Spicer, Capt. M. A. Laing, Mr. Murray Carson, Major D. P. Sellar, Mr. W. O. A. J. Danckwerts, K.C., Lt.-Col. F. W. Scudamore, &c.

THE CROUAN PETROL CAR.—Part II.

REFERRING to Fig. 5, in which the connecting rod, K, is seen from two different points of view, and in one of which the cap, K^1, of the big end bearing is removed, it will be noticed that a very deep groove, K^4, is cut in the upper side of the rod throughout its length. The rod itself is a steel forging, and this groove communicates with oil ways cut in the brasses at both its ends. As already stated, oil continues to drip into the groove when the engine is running, and it is thus led into the centre of the bearings. The cap, K^1, at the big end is held in place by two screws, K^5, on the upper side only; the heads of the screws have small holes drilled through them, and the screws are locked, after being tightened up, by threading a wire through the holes in them both. The cap, K^1, is provided with a hooked projection, K^2, on its under side, and this engages with a corresponding projection on the connecting rod itself. By this construction it is easy to remove the cap, which would not be the case if similar screws were used beneath as well as above. The connecting rod bearings also receives oil externally from the splash action, and the gudgeon pin, K^3, is further lubricated by a small pipe which projects downwardly through the wall of the piston, K^6.

FIG. 5.—Views of the Pistons, Connecting Rods, Commutator, Contact Brush and Ignition Plug.





The gudgeon pin, K^3, is secured to the piston by means of small grub-screws which are fitted between its ends and the piston, the holes into which they fit being partly in the gudgeon pin and partly in the piston, as seen in the illustration. The piston itself has four narrow rings and is of light construction. Its end is shaped somewhat peculiarly, and Mons. Crouan maintains that the spherical form adopted gives special advantages over a flat-ended piston. We are unable to say much about this matter, but understand that he has found advantages to attend this form of construction, and we believe he has some idea that it tends to centre the piston in the cylinder, and keep the pressure on the walls more equable. For our own part, we should be inclined to regard the increased heating surface offered to the burning gases as detrimental.

The commutator, H, is one of the special features of the engine, and is so made that as the revolving contact brush, J, flies outwardly against the pressure of the flat springs, J^2, its contact pin, J^3, completes the electrical circuit earlier progressively. The brush, J, is pivoted to the end of a bracket which is fixed on the forward end of the half-speed shaft. The contact pin, J^3, presses against the commutator near its centre when the engine is running very slowly, and flies outwardly as the speed increases. In the illustration of the commutator in Fig. 5, it must be understood that the brush revolves left-handedly, its contact pin, J^3, pressing against the segments marked H^1, H^2, H^3, H^4, H^5, H^6, H^7, and H^8, of which H^8 are made of insulating material, and the other segments are of metal separated by insulation. The segments, H^1, which are shaped as shown, are directly connected to the terminal on the commutator, H, to which the low tension wire is attached, and therefore when the contact pin presses against them the full current can flow through the coil. The forward faces of these segments, H^1, do not lie radially, but are, as will be clearly understood by the illustration, so made that the pin, J^3, meets them earlier as it flies outward. It will be noticed that the blocks, H^2, lie immediately in front of those to which we have just referred; they are not connected electrically in the circuit, and are merely fitted in order to prevent the contact pin from damaging the sloping face of the blocks, H^1. The contact pin slides easily off the insulating material, H^8, on to the blocks, H^2, and the blocks, H^2, then enable it to slide smoothly on to the segments, H^1. The other segments, H^3, H^4, H^5, H^6, and H^7, are connected with the segments, H^1, through increasing resistances, the resistance coils themselves being wound inside the periphery of the commutator. The object of these sections is to gradually diminish the current flowing from the commutator to the brush, J, and to thus decrease the intensity of the spark between them when breaking the circuit. Although the relative time of ignition is automatically varied by this device, the commutator, H, is connected by means of the projection, H^9, with a hand lever on the dashboard of the car, so that the driver can adjust the actual moment of ignition to suit the temperature of the cylinders or other changes which are liable to occur under working conditions. The brush, J, is prevented from flying outward beyond a certain distance by the stop, J^1.

The Crouan ignition plug, C^2, is also visible in Fig. 5, and the annular space, C^3, between the porcelain and the body of the plug will be noticed.

The cooling water is carried in a tank fixed in front of the dash above the engine. No pump is used for circulating it through the cylinder jackets and the radiator, the circulation being maintained by natural, thermo-siphon, action.

The carburettor fitted to this car is shown both complete and in parts in Fig. 6. It has the ordinary float chamber, L, into which the petrol flows through the pipe-connection, L^1. The float, as usual, regulates the level of the fuel in the spray nozzle, L^2, which projects upwardly in the mixing chamber. The mixing chamber is shown with the cover removed, the cover being a flat plate without any holes in it or fittings attached to it. The cold air finds its way in through the hole, M^4, and the carburettor is fixed close to one of the exhaust pipes so that heated air enters the base of the mixing chamber through the same passage as the cold air. The quantity of air which enters is regulated by the lower slot, M^1, in the sleeve, M, the sleeve fitting inside a cylindrical chamber formed in the main casting. The slot, M^1, is of a peculiar shape which bears a certain relationship to that of the upper slot, M^2, which is the throttle valve proper and controls the passage of the mixture from the carburettor to the engine. It will, of course, be understood that the sleeve, M, has a partition inside it dividing the upper portion from the lower. The sleeve is connected with a small lever at the bottom, by which it can be turned about its axis for varying the quantity of mixture which passes to the engine. The mixing chamber is fitted with a cone piece, L^3, which is seen separately to the right in the illustration, and which slides into place in grooves formed for it in the walls of the mixing chamber. The downwardly projecting portion of it forms a spray cone surrounding the nozzle, L^2, and the upper flat part has slots cut through it which are normally closed by the flat feet of the bent baffle-plate, L^4. This baffle-plate is fixed to a spindle, L^5, and is normally held down by the spring, L^6, the strength of which is adjustable. The baffle-plate does not fit the sides of the mixing chamber closely, but the air which is drawn up between the cone, L^3, and the nozzle, L^2, strikes against it on its way to the throttle valve, and in so doing tends to raise it against the action of the spring, L^6, thus uncovering the auxiliary air slots in the upper portion of the part, L^3. It will be understood that the whole of the air enters the mixing chamber through the regulating slot, M^1, in the sleeve, M, and that the whole of the explosive mixture passes to the engine through the slot, M^2, in the same sleeve. Since the areas of these two orifices are regulated simultaneously, the lower one affects the degree of vacuum formed in the mixing chamber at the same time that the upper one varies the quantity of mixture passing to the cylinders. The slots, M^1 and M^2, are so shaped that the richness of the mixture is maintained at an approximately constant degree in consequence of the fact that a greater quantity of petrol will flow through the nozzle, L^2, as a more complete vacuum is formed in the mixing chamber. This provision alone, however, would not ensure an absolutely constant richness under all conditions of working, and therefore the baffle-plate, L^4, is required. Its upward movement depends upon the pressure of the mixture against its under side, and as it moves upward it allows a greater proportion of the air to pass direct through the mixing chamber instead of passing between the cone, L^3, and the nozzle, L^2, and becoming enriched with petrol whilst so doing. The upward movement of the baffle-plate, L^4, therefore, tends to reduce the richness of the mixture, and this, in conjunction with the action of the sleeve, M, gives an automatic action to the carburettor, keeping the

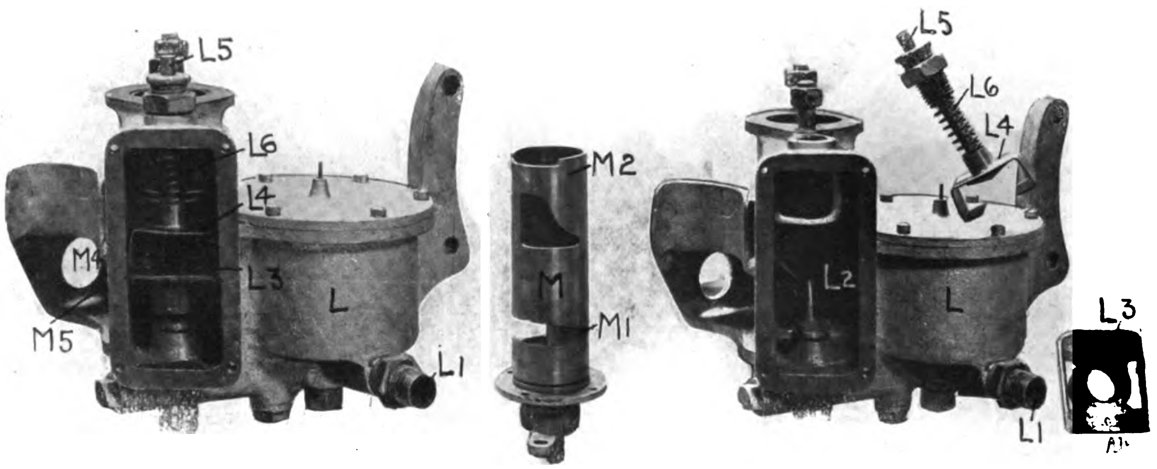


FIG. 6.—The Crouan Carburettor.

Parts of it shown separately.

richness of the mixture the same irrespective of any variations in the engine speed or in the degree of throttle.

On some of the larger Crouan cars a different form of carburettor is employed. This is known as the "Espinasse," photographic reproductions of which, cut through to show its section, are seen in Figs. 7 and 8. In Fig. 8 some of the parts are seen more clearly separately. The float, N, in the float-feed chamber is connected direct to the small valve which controls the passage of the petrol through the passage, N^1, into the float chamber. The fuel is led in the ordinary way to the spray nozzle, N^2, in the mixing chamber, and the bottom of the mixing chamber is open to the atmosphere through two large apertures. The lower portion of the mixing chamber is provided with a jacket, Q, through which some of the exhaust gases from the engine are led, and the upper part, which communicates through two ports, P^2, with the cylindrical throttle valve, P^3, is separated from the lower portion by a sloping circular partition. The spray nozzle, N^3, which, as usual, surrounds the nozzle, N^2, fits the circular partition and normally prevents any air from finding its way up into the upper portion of the mixing chamber, except through the cone itself and through the windows, N^4, provided in it. The cone, N^3, is rigid, with a light metal cylinder, N^5, and a threaded spindle, N^6. The spindle, N^6, passes through the cover, P, of the mixing chamber and is normally forced upward by the spring, P^1, which is adjustable by the fly-nut, N^7. The cylinder, N^5, fits closely over the short piston which forms the under portion of the cover, P. The cover, P, is so made that the space between the piston and the cylinder, N^5, is open to the atmosphere, and the cylinder fits sufficiently closely to cause it to be forced downward by atmospheric pressure when a partial vacuum is formed in the mixing chamber. It will thus be seen that this device operates in practically the same manner as the Krebs carburettor, for when the suction in the mixing chamber increases, the cone, N^3, is drawn downward against the action of the spring, P^1, and some of the air is allowed to pass direct through the windows, N^4, to the throttle valve instead of passing between the nozzle and the cone. It will be noticed that the windows, N^4, are of special shape at their lower ends, and that the quantity of uncarburetted air which is allowed to find its way through them increases considerably as the cone piece travels downward. The throttle valve, P^3, has two triangular holes in it; they simultaneously vary the degree of throttle through the two ports, P^2, to the induction pipe. The throttle valve is, as usual, fitted with a lever, P^4, for regulating it, and this is either connected with a hand control or with a governor, as the case may be.

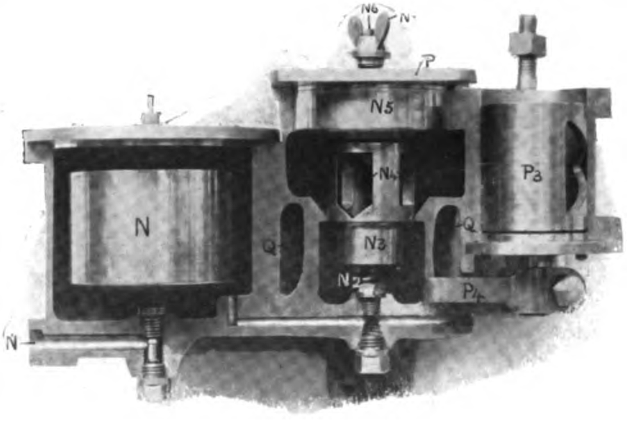


FIG. 7.—Section of Espinasse Carburettor.

The change-speed-gear, which, as we have said, provides five forward speeds and a reverse, is shown in Fig. 9. The box itself is made in two pieces, and it is held in place on the chassis by projecting brackets, cast on the upper part to form clips for the tubes. At its forward end it is bolted to one of the cross-members of the frame, and a piece of tubing is permanently bolted to its rear end for fixing it in the car; the bracket in front is fixed to the cross member, and the rear tube fits down into sockets fitted to the side members of the main frame to receive it. As will be seen, the gear-box is of unusually compact form; it is, in fact, only about 18 inches long. The first-motion-shaft, G^1, has six spur wheels upon it, and is, with them, cut out of the solid metal. Its forward end terminates in a jaw coupling which engages with that shown in Fig. 4 behind the main clutch. Five of these wheels are at all times in mesh with corresponding wheels on the second-motion-shaft, G^2, the latter being mounted freely upon that shaft, and, of course, being of unequal size. The rearmost pinion on the first-motion-shaft engages with the spur wheel opposite to it on the second-motion-shaft through the intermediate wheel, G^3, which is carried on a pin in the cover on the box and gives a "reverse" motion. The first-motion-shaft is steadied midway along its length inside the gear-box by a half bearing, which is bolted inside of the cover. The wheels on the second-motion-shaft are fitted with large jaw clutch members, and corresponding two-way clutches, G^4, are fitted upon feather keys on the shaft between each pair of wheels. These clutches are controlled by pivoted levers which are forked at their one ends to engage with the clutches, and they carry small rollers at their other ends, which ride in cam-grooves in the three

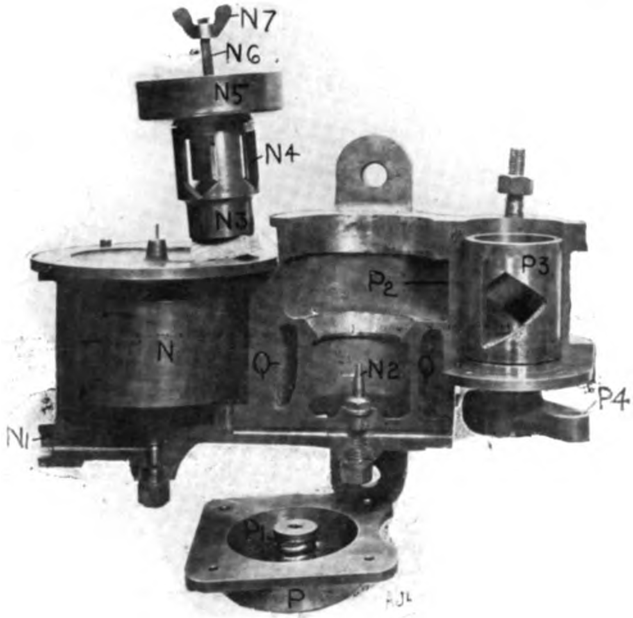


FIG. 8.—Section of Espinasse Carburettor with Spray Cone removed.

cams seen on the cam-shaft, G^3. These cams are so shaped that as the cam-shaft is caused to rotate they successively introduce the "reverse," the first, the second, the third, the fourth, and the fifth speeds. The cam-shaft is rotated by a toothed rack which engages with the gear wheel seen on its forward end. The rear end of the cam-shaft, G^3, is fitted with another cam-plate, outside the gear-box, and a small roller mounted on a pivoted lever, G^6, forms a spring catch in conjunction with the cam-plate for ensuring that the required gear is at all times properly engaged, or that the zero position is correctly maintained. The back of the cam-plate, G^5, is fitted with a projection which comes into contact with a small lever if any attempt is made to introduce the reverse gear without having first removed it. The safety lever is connected with a small pedal near the dash, and only when depressed does it allow the reverse gear to be used. The rear end of the second motion shaft, G^2, is fitted with a combined brake drum and spring drive. It also forms a part of the universal joint from which a longitudinal shaft transmits the power to the differential gear on the enclosed live-rear-axle.

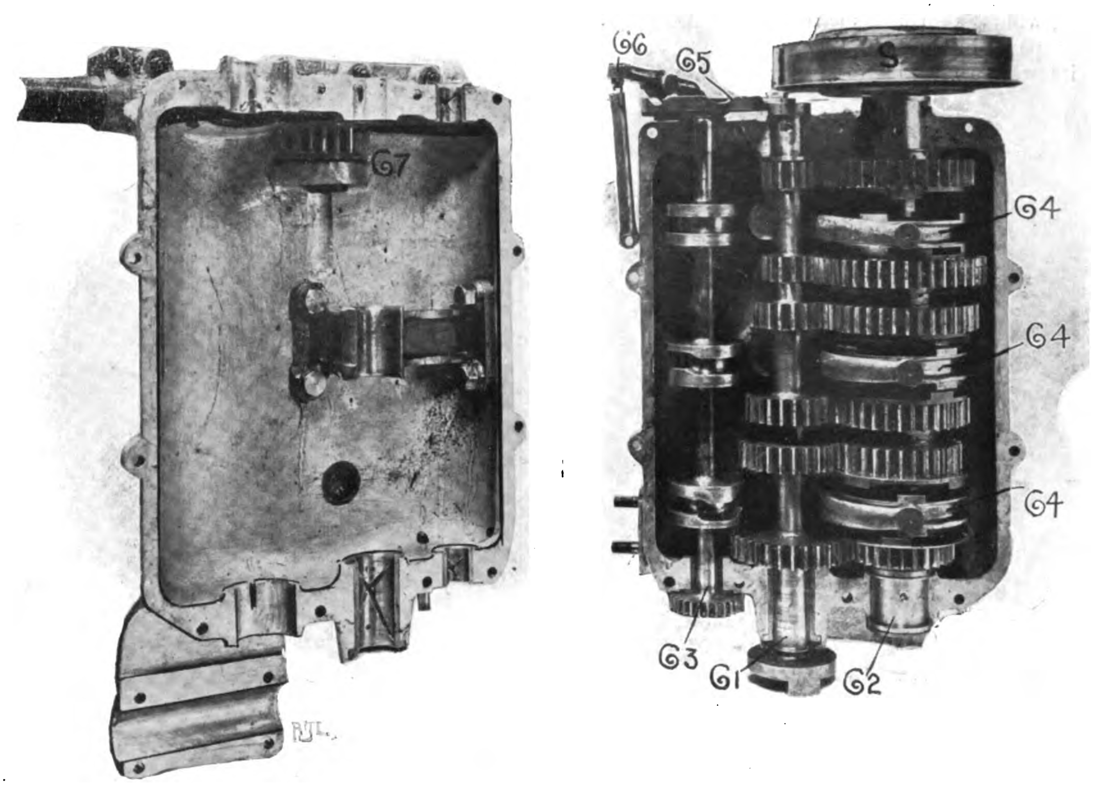


FIG. 9.—The Change-speed-Gear, with Cover removed.

The various gears are operated by means of the hand-lever, R (Figs. 2 and 3), on the steering pillar. This handle consists of a horizontal spindle with a small hand-wheel attached to it. It is mounted on a sleeve which surrounds the steering pillar, and the sleeve carries at its lower end a spur-wheel which engages with the sliding rack operating the change-speed-gear; by using the hand-lever, R, so as to rotate the whole sleeve about the steering pillar, the various gears are introduced; the hand-lever points forwards for the neutral position and towards the driver when the top gear is in use. The hand-lever also serves a second purpose, for, if it is turned about its own axis (in the same manner that a stop-cock is turned on and off), it operates the throttle valve on the carburettor.

The foot pedal which operates the main clutch is also connected with the throttle-valve in such a manner that the engine is prevented from racing when the clutch is disengaged. Another foot pedal alongside it applies a double-acting band-brake which acts upon the brake drum on the rear end of the second-motion-shaft. It, and the side lever, which applies the brakes on the hubs of the rear wheels, are both connected with the main clutch, so that the application of the brakes automatically disengages the clutch and partially closes the throttle valve.

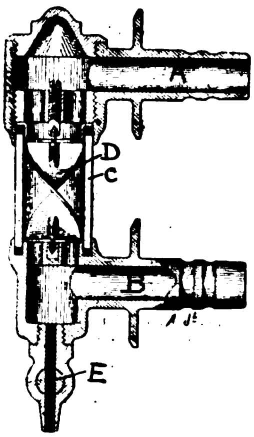
The rear axle is connected with the main frame by distance rods, which are pivoted to the side members of the latter. These rods not only pass direct back to the axle parallel with the side members of the frame, but also branch diagonally and are clipped to the aluminium gear cases, which encloses the differential and the bevel wheels driving it.

The 6½-h.p. car is usually fitted with wheels, 750 mm. by 85 mm., and with a tonneau body. The vehicle from which our photographs are taken, however, not only has a light spider body, as seen in the illustrations, but the pneumatic tyres fitted to it are narrower—65 mm. wide.

The steering gear does not call for any special mention; it is of the irreversible wheel type.

The Crouan cars have been taken up in England by Messrs. C. Isler and Co., of Bear Lane, Southwark Street, S.E.

WATER-CIRCULATION INDICATOR.



An American Water-Circulation Indicator.

OUR illustration is a sectional view of a neat device of American origin, which is intended to be fitted on the dashboard of a car, and to show whether the cooling water is circulating properly through the jackets of the engine cylinders. It consists of the pipe fittings, A and B, by which the water is led through a short glass tube, C, fixed between them. The fittings, A and B, are so made that they carry small adjustable bearings for a light screw, D, which is mounted inside the glass tube, and is capable of revolving. The portion D is shaped like an Archimedean screw, and is caused to revolve by the water when it flows through the apparatus, the speed at which it runs varying according to the rate of flow of the water. The lower fitting, B, is provided with a drain cock, E.

This little device is interesting, although the general principle adopted is not new, and similar forms of it, in which the water is made to flow upwards and to carry light threads or ribbons so that they are visible through glass, have previously been used in this country. It is even doubtful whether any instruments of this type would be superior to the ordinary pressure gauge generally employed, for they essentially involve the carrying of two large pipes (instead of one small one) to the dashboard, and they can only indicate the rapidity of circulation very roughly.

* * *

THE Board of Agriculture have sent us one of the new Ordnance maps of England and Wales, which are being prepared for the whole of the British Isles bv this department on the scale of two miles to one inch. The maps are the clearest we have yet seen, and are admirably suited for automobilists. The main roads are coloured, and the scale upon which the map is given makes it convenient for reference in view of the speed with which automobiles can travel. All hills are shaded, woods are coloured green and water blue, contours being brought out in brown, the bolder slopes being denoted by stipple shading in the same colour. The altitudes above sea level are given in very clear figures and afford an admirable guide as to the character of the country through which the roads lie. Towns, villages, roads, railways and stations, rivers, canals, and other land-marks are each and all separately and very clearly indicated. Each sheet, which measures 12 inches by 18 inches, can be procured, either on thin paper or mounted on linen, at the price of 1*s*. per sheet, and the method adopted of folding the map outwards so as to admit of its being read without necessarily opening the whole map, is a useful innovation. In the words of the official circular, it undoubtedly "meets a long-felt want." An advantage is that in addition to its being procurable through the ordinary channels and the Ordnance Survey Office, Southampton, it can be ordered through head post offices in towns where there are no agents.

RACES, RECORDS, AND TRIALS.

A ONE-KILOMETRE hill climb is to be held at Perigueux on June 1st, with the usual eight classifications according to weight.

A RACE from Moscow to St. Petersburg, organized by the Russian A.C., will be held next month, and will include a tourist section.

THE entries for the Scottish Automobile Club hill climb at Lanark, which takes place to-day (Saturday), number about a score, and it is possible that among them will be that of the most powerful car ever seen in Scotland.

OWING to complications arising from the clashing of the dates of the various Continental and other automobile fixtures, it is highly probable that the Mont Ventoux Hill Climb, announced for June 18th, will either be run off on June 11th, or will be postponed until the end of July or the beginning of August, probably the latter.

DETAILS of the Ostend Automobile Week are now announced. July 12th, race from Ostend to Blankenberghe (provided the new road is finished in time), then from Ostend to Dunkirk and back (100 km.); July 13th, the same course for amateur drivers of tourist cars; July 14th, standing mile and flying kilometre for racers; 15th, the same for tourist cars; 16th, motobicycle races; 17th, *Corso Fleuri* and Battle of Flowers; 18th and 19th, excursions in the neighbourhood.

THE Executive Committee of the Automobile Club has determined that after the Gordon-Bennett Race and the various events connected with it are over, and the accompanying excitement has subsided, the Electrical Committee will meet at intervals, to elaborate the rules for the trials of electrical vehicles which, as we announced a fortnight ago, it has been decided to hold in May of next year. The reason for this lengthy postponement of the trials for electrical vehicles is tolerably obvious. The Electrical Committee and Sub-Committee arranged for a series of trials of electrical vehicles to be carried out last July. They held a large number of meetings, and occasionally had quite spirited debates. The rules which they elaborated were a concentration of wisdom, sagacity, and forethought, and when they had everything nicely arranged, not a single electric vehicle came up to the scratch, and the trials had to be abandoned. There is nothing like giving people plenty of time to prepare. Electromobilists have it this time, and we trust they will make a more effective showing next year.

Motor Bicycle Track Records.—Last week (May 13th), on the Canning Town Track, G. A. Barnes made an attempt to cover 50 miles in the hour, but the strong wind driving across the track prevented him attaining his object. He managed, however, to score new records from 27 miles upwards, his performance on the previous Saturday (May 9th), which we duly recorded at the time, for one up to 27 miles, not being disturbed. At 28 miles Barnes's time was 3 mins. 27⅗ secs. better than F. W. Chase's previous record, and steadily keeping the pace up to the end of his run, he broke down Chase's 44 miles for the hour and all in-between record times, finishing up with 48 miles 1,395 yards in the 60 mins. The chief times were: 10 miles, 12 mins. 23⅗ secs.; 20 miles, 24 mins. 33⅘ secs.; 30 miles, 36 mins. 48⅗ secs.; 40 miles, 49 mins.

2⅖ secs. ; 45 miles, 55 mins. 11 secs. ; 48 miles, 59 mins., and in the hour, 48 miles 1395 yards.

AT the Celtic Park, Glasgow, last Saturday, H. Martin succeeded in lowering the figures for the mile and 5 miles motor cycling track records. His time for the mile was 1 min. 11⅗ secs., and at the 5 miles, 6 mins. 6⅕ secs.

National Belgian Circuit.—Last week we gave particulars of this trial, organised by the Belgian Club, up to the time of going to press. On the fifth day, in splendid weather, the open flying kilometre was run off between Lives and Brumagne on the Liege-Hoy road, and the "Citadel Hill" climb at Namur (2·8 kilom.) concluded the day's work. The roads, after the heavy rains, were in a fearful condition, so that poor times were recorded for all competitors in both events. The best time for the cars over the kilometre was made by Baron de Crawhez in 1 min. 16⅗ secs. ; and motocycles, Elskamp, on a Minerva, 1 min. 3 secs. On the Citadel Hill, Langlois, on a Vivinus car, headed the list with 4 mins. 36 secs., De Crawhez being second in 5 min. 1 sec. ; and Flamand, on a Minerva motocycle, did the best time of the day in 4 mins. 9 secs. The competitors reached Brussels again on the 14th inst. The chief results for the General Classing being as follows:—De Crawhez (Panhard) 1,902 points; Van Langendouck (De Dion) 1,872 points; Francotte (Malevez) and Raczinski (De Dion) ties, 1,849 points; Hombach (Vivinus) 1,817; Opperman (Malevez) 1,776; Crignolion (C.G.V.) 1,752; De Lunden (De Dion) 1,413 points.

A RUN from Mannheim to Baden-Baden was organised by the Rheinischen Automobil Club for May 10th. The distance was 100 kiloms., and 53 entries were received. Three categories were created, viz.: 1. 9-h.p. cars. 2. 9 to 16-h.p. cars. 3. Cars over 16-h.p. The results were:—

CAT. I.—1. 8-h.p. Benz, 2 hrs. 36 mins. 37 secs. 2. 7-h.p. Bergmann, 2 hrs. 51 mins. 3. 7-h.p. Bergmann, 2 hrs. 57 mins.

CAT. II.—1. 12-h.p. Benz, 2 hrs. 17 mins. 2. 12-h.p. Opel-Darracq, 2 hrs. 19 mins. 3. 12-h.p. Adler, 2 hrs. 21 mins. 15 secs.

CAT. III.—1. 20-h.p. Opel-Darracq, 2 hrs. 21 mins. 2. 18-h.p. Benz, 2 hrs. 24 mins. 20 secs. 3. 20-h.p. Opel-Darracq, 2 hrs. 29 mins.

THE flying kilometre fixture of the Swiss Automobile Club was held on the 18th inst. The condition of both weather and roads was perfect, and the following are the chief results:—Cars over 650 kilogs., Rochet Schneider, 39⅗ secs. ; Richard-Brazier, 46⅕ secs. ; Martini, 56 secs.

Light cars, 400 to 650 kilogs., Richard-Brazier, 49 secs. ; De Dion Bouton, 1 min. 22 secs. ; Cottereau, 1 min. 26⅕ secs.

Voiturettes, Berliet, 1 min. ⅕ sec. ; Mercier, 1 min. 19⅗ secs. ; Cottereau, 1 min. 22 secs.

Bicycles over 50 kilogs., Griffon, 47⅕ secs. ; Peugeot, 52⅖ secs.

ANOTHER successful ascent was made by the Lebaudy airship on the 15th inst., travelling against the wind from Moisson to Rosny-sur-Seine, various manœuvres being carried out above the park at Rosny. One of the ventilator fans which keeps the balloonette inflated with air became detached on the return journey, and necessitated a somewhat rapid descent near Sandrancourt, on the Seine, but the behaviour of the airship was otherwise most satisfactory, as it made headway at the rate of 7½ miles per hour against a wind blowing seven yards a second, i.e., approximately 13 miles an hour.

THOUGH M. Santos Dumont has been manœuvring with his small airship he has not abandoned the construction of his No. 10, which will be of huge capacity and capable, he maintains, of lifting quite a number of passengers. No. 9, which we illustrated last week, he calls his toy airship. He is even contemplating the construction of No. 11, which will closely resemble the No. 6, with which he won the Deutsch prize. Some of the Parisians are getting rather witty at M. Dumont's expense, and are asking the question as to when we shall see Santos Dumont No. 999?

MECHANICAL ROAD CARRIAGES.*

By W. WORBY BEAUMONT, M.I.C.E.

IN the concluding lecture, given on the 18th inst., Mr. Beaumont dealt with a number of typical vehicles of the present day, and with the evolution of the voiturette, and its influence on the construction of the larger vehicles. He instanced numerous ingenious and important devices which the makers of small vehicles have produced, and which would hereafter be useful in motor developments. The influence in the past of the Bollée Voiturette and the Renault as two different types, then the De Dion and the Gladiator chain drive as other types, has led to the light cars, and subsequently to the heavier cars of to-day. References followed to the recent De Dion gear, the chain gear of the Brooke car, and the arrangement of the Humber and Wolseley gears, which all represented modern types, and illustrations were given on the screen of the Brooke, Humber, Wolseley, Daimler, Panhard, Decauville, Velox, and Maudslay cars; also the New Orleans car with its new fixed axle, but bevel gear and live axle drive. Heavy vehicles were represented by several of the Thornycroft lurries and wagons of different type, with their gearing, and also the Coulthard lurry and tipping wagons, the Yorkshire Steam Wagon Company's lurries, the Mann tipping wagon, and the recent Milnes Daimler omnibus. Concerning this last vehicle, Mr. Beaumont said that the motor had been now increased from 16-h.p. to 20 brake h.p. in the omnibuses carrying 32 passengers. He also referred to the satisfactory results attending the running of omnibuses in Cornwall and Hastings. He again urged the adoption of vehicles of moderate weight and power only, but with regard to other kinds of omnibuses, such as petrol-electrics, he remarked that there was insufficient experience at present upon which to base an opinion. He expressed a very favourable opinion on electric vehicles of the lighter kind, and towards the latter part of the lecture specially mentioned a form of clutch based, to some extent, upon the Weston clutch, but presenting a very neat combination of clutch and reversing gear, as made from the designs of Messrs. Bradley and Pidgeon, and employed on the 22-h.p. Daimler car of Mr. Henry Edmunds.

On the question of speeds at which cars could be driven round curves, and at which cars would begin to overturn on curves, a diagram was

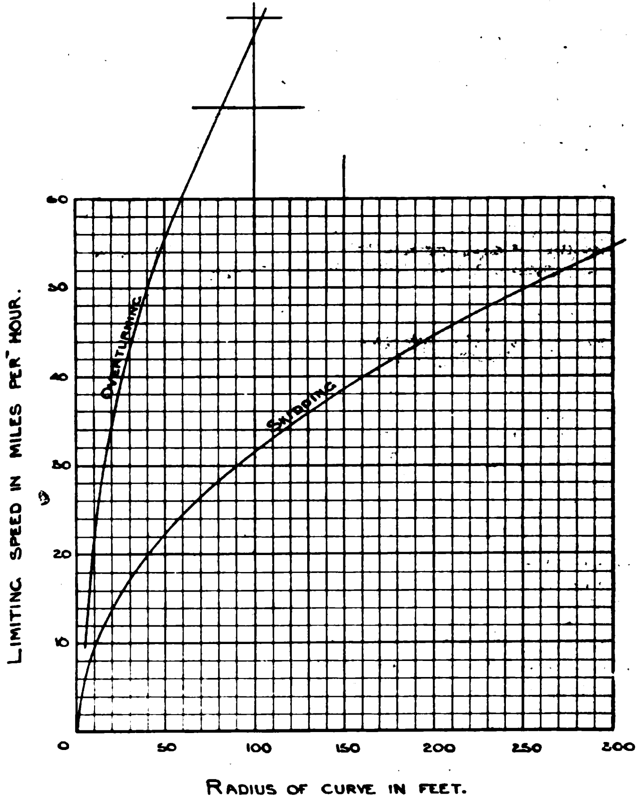


Diagram showing speeds and curves at which (*a*) vehicles will begin to skid on dry roads, and (*b*) will overturn.

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*Fourth and Concluding Cantor Lecture.

shown based on calculations which are of interest in view of the recent accidents, including that of the late Count Zborowski. This diagram is here reproduced, and it shows, for instance, that a car, when running at about 55 miles an hour, would be liable to skid when directed on to a curve of 300 feet radius, or, at a speed of 20 miles an hour, a car would slip on a curve of a radius of 40 feet, but, as the second curve shows, the same car on the latter curve would not begin to overturn until a speed of 50 miles an hour was reached, the centre of gravity of the car being assumed to be two feet above the ground.

Mr. Beaumont then proceeded to emphasise the necessity for the best possible construction and maintenance of roads and road surfaces. In regard to future probabilities, he was of opinion that further development of the internal combustion motor might be looked for both in the horizontal and vertical forms. In dealing with business vans generally, he laid great stress upon the importance of trustworthiness, and deprecated the introduction of minute economies; he thought that for a time simplicity was of more importance than on any other feature in the whole of the motor and driving gear. As to future omnibus services, the lecturer thought that electric motor omnibuses running on ordinary roads, and provided with current from overhead wires, as already experimented with on a considerable scale by Messrs. Siemens and Halske, might prove of considerable importance. For the heavy transport work between the docks, railway stations, and the mill districts, as of Yorkshire and Lancashire, it was pointed out that tramways or tram plateways would become necessary for their proper and economical working.

* * *

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THE MAYHEW *v.* SUTTON DECISION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—One of the concessions that the Committee of the Automobile Club asks members to bargain for is shortly stated as "Alteration of the Law as laid down in Mayhew *v.* Sutton." The meaning of this is rather vague, but if taken strictly it seems to me that it is a concession which cannot reasonably be asked for. The decision of the High Court was a decision on a point of law, and was to the effect that to prove a case of "driving to the common danger" it was not necessary to bring evidence that any person was actually endangered. The Court did not say what evidence *was* necessary, but only that it was not essential to proving the case that some person must be shown to have been in actual danger. The only way in which we can "alter" a simple statement of law of this kind is to reverse it, *i.e.*, that the law shall be that no case of dangerous driving can be proved unless evidence is given that a person was actually endangered.

Is this a reasonable line to take? I think not.

The object of restrictions of any kind, no matter of what nature, in the use of motor cars can have but one rational purpose, and that is the avoidance of danger to general users of the highway. Motorists should drive in such a way that no danger *can* arise to other road users under the reasonable and proper use of the roads by such users. This is quite independent of the fact of whether there may or may not be persons using such roads at the moment, and consequently is independent of the fact of actual danger to such persons.

Why the present, or any specific, speed limit is logically absurd and practically unnecessary is because the speed is to be restricted to a given maximum at all times, even when a higher speed could not possibly endanger other road users. This absurdity does not, however, justify us in asking for the other extreme, viz., that we may travel anywhere at any speed irrespective of *possible* danger to others and only respective of *actual* danger.

Take, as an example, an open road with no turnings into it, or a road where the turnings are not obscured by high hedges, which would obstruct the general view of a sufficient part of their length from along the main road, we have a state of affairs in which a motorist on the main road has a sufficient view of *all* the highway, including that of the turnings, to *assure* himself that at the speed he is travelling no one using the roads in a fair and proper manner is, in fact, endangered. There is no need for the highway to be a deserted one, the motorist would still be justified in proceeding at speed provided he has a sufficient view of the movements of all the traffic within, what I may call, danger zone of himself.

But take, on the other hand, a winding road with high fences, &c., or one with turnings, round which the motorist can only see a yard or two—places, in fact, where there *may be* traffic within "danger zone" of the motorist which he cannot see. Then I consider that his danger zone is limited by the extent of the visible highway, and if he drives at a higher speed than is consistent with power to avoid an accident by collision with any traffic that might suddenly enter his visible zone, he is driving dangerously whether there is any such traffic there or not.

Thus what we can reasonably ask for is not a reversal of the law in the Sutton and Mayhew decision, but a definition of what *is* "driving to the common danger," so as to avoid frivolous prosecutions and, perhaps, unjust decision of facts by local reactionaries. I do not pretend to have found the ideal definition, but I should define dangerous driving somewhat as follows:—

"Proceeding on the highway at a speed or in a manner inconsistent with either (*a*) the safety of other traffic or passengers actually upon such highway, or (*b*) the extent of highway visible to the motorist."

I have no doubt that the majority of motorists do drive in this way, and that the Club would deprecate any other. It is the only rule of driving necessary for the safety of other traffic, amongst which, of course, there are other motorists as well.

Yours truly,
R. HADDAN.

18, Buckingham Street, W.C.

FACILITIES FOR CHARGING ACCUMULATORS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We have now under preparation a map of England and Wales, showing those places where main batteries for electric automobiles and ignition cells for *petrol* cars may be recharged, and a directory giving the addresses of central stations and private premises where such facilities can be obtained. In order that this list may be as complete as possible, we should be much obliged if you could find space for this letter in your valuable journal, so that any of your readers who themselves have charging facilities, or know where they can be secured, either in London or the provinces, may send us the necessary particulars for inclusion.

The information we require is:—

Name and address.
Source of supply and maximum voltage and current available.
Charge for current per unit or per cell.
Any facilities for garage and repairs.

For inserting these particulars in our directory and map, no charge whatever will be made. Particulars should reach us not later than the middle of June, but the earlier the better. We feel confident that such a publication will be of great service to automobilists generally, and as the map and directory when folded will only measure 7 by 4 inches, it will easily go into the pocket.

Thanking you in anticipation, we are,
Yours faithfully,
THE ELECTRICAL TIMES.

8, Bream's Buildings, Chancery Lane, E.C.

* * *

NEW premises, including ample storage room, for the Long Island Automobile Club, are now in course of construction at 32, Hanson Place, Brooklyn.

* * *

BRITISH automobilists touring on the Continent have now been granted very important privileges through arrangements which have just been concluded by the Automobile Club through the A.C. de France. Practically British manufacturers can now be placed on the same footing in regard to registering a special make of car with the French authorities, and all owners of such cars can then, under certain specified conditions, receive at once the necessary permit from the French authorities to "circulate" in France, instead of having to conform to the usual tiresome and necessary examination of the car and its capabilities before permission is given to use the vehicle in France. All manufacturers should, both for their own sakes and the convenience of purchasers of their cars, at once conform with the necessary regulations through the A.C.G.B.I., so that they may notify all owners of their vehicles of the facilities for taking their cars into France which have been completed. Equally advantageous arrangements have been made in regard to custom dues and driving certificates.

MR. SYDNEY MORSE, of 37, Norfolk Street, Strand, has been appointed Solicitor to the Society of Motor Manufacturers and Traders.

THE Beckenham Urban District Council are prepared to consider tenders for a motor steam fire engine. Tenders must be in by June 1st.

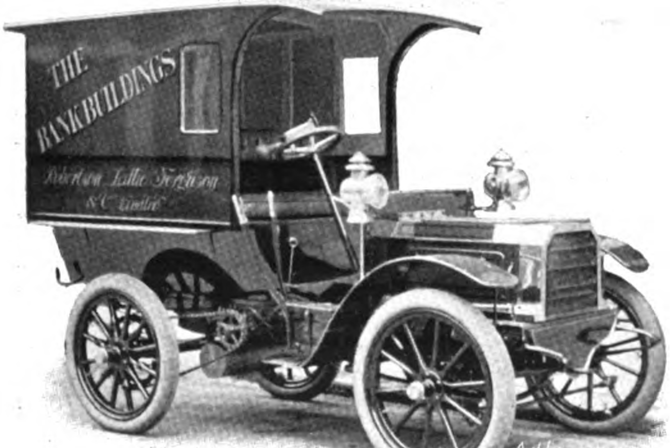
THE instalment system of payment for motor cars has been adopted by the Continental Automobile Company, Limited, of 20, Long Acre, W.C.

THE Chief Constable of East Sussex has asked the County Council to provide him with a motor car for inspection duties instead of a horse and trap.

UNDER the will of the late Colonel M'Calmont it has been decided in the Chancery Division that the words "contents of the house" were intended to include a motor car in the stables.

"THE Use of Petrol Motors for Locomotion" and "Applications of Electricity to driving Carriages in Towns" were subjects discussed at the Institution of Civil Engineers Conference held this week at Westminster.

THE resolution proposed at the London Chamber of Commerce, which we published last week, in regard to the speed and tare limits for motor vehicles, was passed unanimously. It was proposed by Mr. Woodfine, representing the Society of Motor Manufacturers and Traders, and seconded by Sir Albert K. Rollit, M.P.



A 10-h.p. Gladiator Light Delivery Van, built for Messrs. Robertson, Ledlie, Ferguson and Co, of Belfast, three of which are on order—two for Belfast, and one for Cork. The vehicle is provided with a two-cylinder engine, and the chassis has been specially designed with the gearing arranged below the level of the frame, and with the necessary strength for its purpose. The gearing enables it to travel at a reasonable speed under ordinary conditions, and affords a sufficiently low gear for climbing stiff hills. The carrying capacity is large in comparison with the size of the complete machine. The whole of the interior is available for goods.

AN extensive show room has been opened by the British Electrical Engineering Company at their head office, Victoria Works, Belvedere Road, Lambeth, where they have a number of the latest types of their motor cars on exhibition.

WHIT MONDAY is the date for the great annual parade of cart-horses in Regent's Park. Remembering the fearful weather experienced on May Day this year, we would suggest that in fixing the date of the annual motor parade for future years it would be advisable also to select Whit Monday, as giving greater chances of more settled weather than the earlier date.

APROPOS of the legislative question, it is well to bear in mind that the maximum penalty for furious driving under the Act of William IV. is £5. If the Act of 1896 be abolished therefore that is the maximum fine that automobilists will have to dread. Why the penalty should have been so much increased for their benefit is one of those mysterious workings of the legislative mind which nobody has probably fully fathomed.

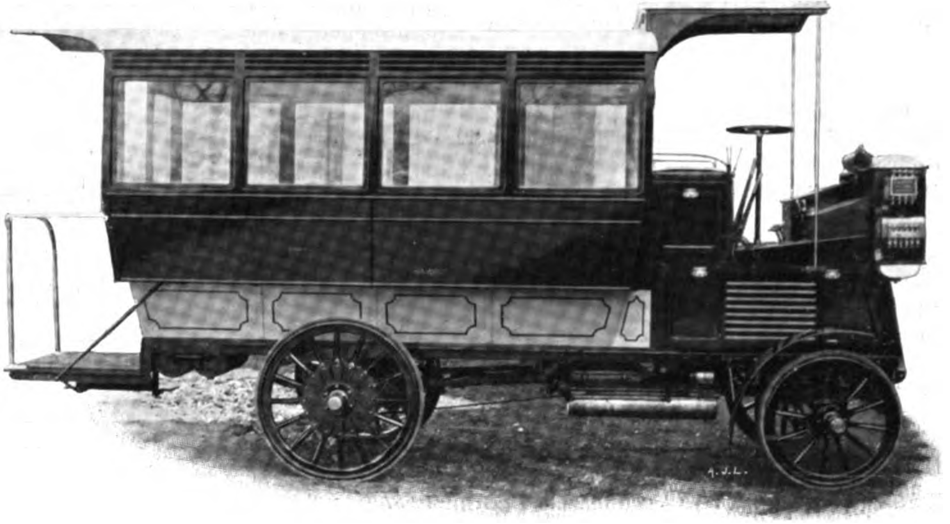
AN experienced automobilist in America gives the following advice:—"Never dodge cows. They are stupid, and will move about in ways least expected. You had better stop short and see what they are going to do about it." He winds up by saying that "A woman acts very much like a cow or a sheep. First she stops and then she jumps, and the jump is just as likely to be in the path of the machine as not." The moral is obvious.

THE "non-stop" run of Captain Deasy on the Rochet-Schneider car from London to Glasgow, which was fully reported recently, it appears was not an absolute non-stop journey, although for all practical purposes it may be regarded as such. On two occasions, owing to a wrong turning being taken, the engine was momentarily stopped, and on a third occasion it was voluntarily stopped by Captain Deasy for a few minutes whilst petrol supplies were being put into the tank at Newcastle.

AT a meeting of the Aeronautical Institute and Club, held last week, a paper by Captain Callaway, of Brighton was read, giving particulars of his patent navigable balloon. The balloon is of novel design, being shaped like an inverted ship, and has sufficient capacity to lift the aeronaut and gear suspended beneath. It is a distinct departure from the "Santos-Dumont" type of airships, and is propelled by wings fixed on each side of the car, and worked by hand power. The wings are specially constructed to "feather," which has the advantage of lessening the air resistance on their surfaces during the upstroke. The balloon is steered with a rudder fixed at the back, and operated from the car. In the discussion which followed Captain Callaway's paper, Mr. A. D. Fox gave details of a balloon designed by himself which has many features not hitherto adopted by inventors, one of the chief being the use of four screw propellers, each one of which is capable of being used for propelling, ascending, and descending, as may be required. Mr. Fox will read a paper at the July General Meeting giving full details of his invention. Mr. H. Middleton, of Brighton, is to read a paper on "The Fundamental Principles of Flight," and also exhibit working models illustrating his remarks, at the June General Meeting.

SOME time ago a correspondent of the Journal, in humorous vein, suggested that movable milestones were being employed by the police in Surrey and elsewhere for the purpose of facilitating the conviction of automobilists on the usual charge. It now appears that a milestone on the London and Uxbridge Road was some time ago removed, it is said by the London Tramways Company, and has not yet been replaced. We sincerely trust it is not in the hands of the police for any such sinister object as our correspondent suggested. At the same time we should like to call the attention of the Tramways Company, who are credited with the onslaught on the milestone, to a passage in the good old Act of William IV. that "any person who shall pull down any milestone or post erected upon any highway" shall be punishable by the Justices of the Peace.

WE have frequently had occasion to point out that motor car drivers have not in the past invariably been all that is desirable in servants of the kind, a state of things which the Automobile Club is at present engaged in doing its best to remedy. An amusing satire on the question was published in *Answers*, taking the form of a more or less imaginary description by an automobilist of the various drivers whom he has engaged and from whom he has suffered. They one and all, according to the author, had a perfect passion for ordering all sorts of accessories, whether necessary or not, and running up his expenditure to an alarming extent. This evil, of course, exists, though we believe it is rapidly diminishing. The article in question is amusing reading, but we would recommend everybody to take it, not with a pinch but a handful of salt.



The above illustration shows the first Stirling Motor Omnibus which has been consigned to Johannesburg, and is to run between that city and Auckland Park. It is fitted with a four-cylinder motor, developing 24-h.p., and is geared to run at a maximum speed of 14 miles per hour; two lower speeds being also available. The water circulation is on the Stirling system, in which no circulating pump is required and a combined tank and radiator form the dashboard in front; the tank holds about 10 gallons. We learn that a trial run of 100 miles was recently made in hilly country in the South of Scotland, when the vehicle carried a load of 30 cwt. of pig-iron, and that its performance fully came up to expectation. It has a seating capacity for 15 passengers in addition to the driver, and has solid rubber tyres fitted to it. Its weight in running order is about 38 cwt.

ONE Joseph Flexman, of Manor House, Gunnersbury, was taught a necessary lesson last week at the Brentford Police Court, when he was prosecuted by Mr. Staplee Firth, representing Major Sellar, of the 4th Dragoon Guards. Flexman struck the Major across the face with his whip when he was reasoned with for having driven his dog-cart on the wrong side of the road on the Bath Road, and persistently obstructed the passing of Major Sellar's motor car, which was being driven by Capt. Bald, of the 15th Hussars. The Bench thought it was a very bad case, as there was no evidence that the motor car had in any way disturbed the horse, or that the driver of the motor car had in any way inconvenienced the driver of the horse. Flexman was therefore fined the full penalty, £2, and ordered also to pay £3 in addition for costs.

WE desire to draw attention to the letter from our contemporary, the *Electrical Times*, which we publish in another column. The *Electrical Times* is preparing a list of stations and premises throughout the country where current for charging both the ignition cells in petrol motors and the larger batteries of electromobiles can be obtained. It is of advantage for all automobilists that the list of such stations embodied in the map should be as comprehensive as possible. Public charging stations our contemporary, of course, is already fully acquainted with. What is needed is that any private businesses or works, which are able and willing to provide charging facilities, and which may not at present be known to the compilers of the list, should send in their names to the *Electrical Times* at 8, Bream's Buildings, Chancery Lane, as soon as possible.

THE Eastern Counties Automobile Club last Saturday arranged for their first season's run, the meet being at Great Bentley, a run from there being made to the Grand Hotel, Clacton. Messrs. W. T. Pretty, F. L. Bland, C. D. Castell, W. H. Blomfield, G. Milbank, G. C. Ching, J. R. Egerton, A. Hackblock, &c., were of the party, and were met at Great Bentley by Colonel Davis, of Walton-on-Naze, the High Sheriff of Essex, who led the cars to Clacton. Unfortunately rain set in for the return journey, and somewhat spoilt an otherwise pleasant outing.

MESSRS. GEIPEL AND LANGE, of Parliament Mansions, Westminster, have recently developed an ignition system which is somewhat similar to that adopted on the Chenard and Walcker cars, fully described by us. The ignition plugs on a two-cylinder engine are connected up in series with one another across the high tension terminals of the induction coil. Curiously enough, the Company have developed their system without having been aware of its previous use, and they have designed a special apparatus in the way of an induction coil for enabling anyone to adopt the new system without making any structural alteration on their vehicles.

WE are very thankful to note that the London County Council is entering on a determined campaign against one of the practices of the less refined Englishman which unfavourably distinguishes him from most of his Continental neighbours. We refer to the practice of inopportune and unlimited expectoration. Since April 28th it is an offence to indulge in this pastime in any of the tramcars run by the Council. We hope before long to see the motor omnibus extensively adopted on the London streets, and we sincerely trust that when it comes into vogue the example of the Council will be followed in severely repressing the objectionable practice to which we have referred.

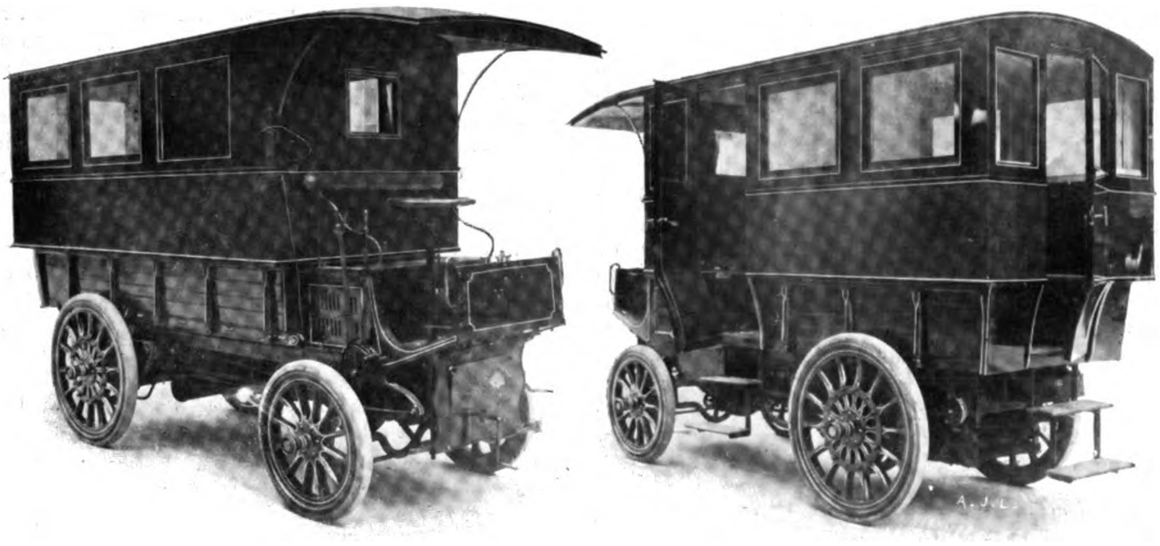
THE way in which thinking people are gradually being converted to supporters of the new locomotion is well instanced by the remarks made by Sir Reginald Hardy to the Staffordshire County Council. Sir Reginald Hardy, who is the Chairman of the Main Roads and Bridges Committee of that body, declares that one great point in favour of automobilism is the small amount of damage which the friction of the wheels of motor cars inflicts upon the high roads as compared with the wear and tear produced by iron wheels and iron-shod horse hoofs. This will not be pleasant reading for the good people who try to make out that the main reason for opposing the motor is its effect in increasing the rates for highway maintenance.

A DIAMETRICALLY opposite view was expressed before the County Councils' Association meeting at the Guildhall by a Mr. W. B. Hulton, who read a paper on "Motor Car Traffic." Mr. Hulton appears to have discovered, or have been discovered by, the egregious Rector of Charlewood, who, on the occasion of the September trials last year, gave vent to the astounding statement that the motor cars running in these trials had injured the roads of Surrey and Sussex to the precise amount of £1,056 0*s.* 5*d.* We thought that at the time the worthy rector's letter appeared in the *Times* he was made mincemeat of by Mr. Claude Johnson and ourselves, and that his foolish and unfounded accusations had passed into the limbo of forgetfulness. It is particularly amusing to note how they are resurrected in Mr. Hulton's paper.

LAST week we gave a *résumé* of the position in New York State in regard to the difficulties which have arisen in connection with the Doughty-Bailey Automobile Bill restricting the privileges of automobilists. Since then the A.C. of America held a very influential meeting, when Mr. President Shattuck, who had delayed his departure to Europe for two days to enable him to be present at the gathering, attempted to justify the action which he and other leading officers of the Club had taken. From the explanations it would appear that they had obtained as many concessions as they thought possible under all the circumstances. Judge J. C. Church, following, explained very fully that the Long Island Highway Protective Association had made a dead set against automobilists, and were the prime movers in the action against motorists. Their (the A.C.A.) business was to confound their plans and frustrate their knavish tricks. Last year open opposition was tried, and the Automobile Club lost hopelessly, the result being the objectionable Cocks Bill in addition to the penal code. This year more diplomatic methods were employed to overcome prejudice, and by this means, owing to conferences with the Protective Association, concessions here and there were obtained, and such phraseology and words introduced into the Bill as to render the whole statute contradictory and arguable, in the hope that it would when tested before the legal authorities be pronounced unconstitutional, and therefore inoperative. The explanations offered do not appear to have met with much sympathy from the opposition (led by Mr. Percy Owen, one of the American drivers in the Gordon-Bennett Race), but in the end the majority of the members present, whilst censuring the Doughty-Bailey Bill and objecting to it entirely in principle, resolved that, in view of the action already taken by the Club on the subject, no appearance should be made officially before Governor Odell with regard to the Bill. As a consequence the Bill was last Saturday signed by the Governor of New York State. Owners and dealers are up in arms over it, and retaliatory measures are advocated to compel horse-drawn vehicles also to keep within the speed limits set for them in order that the unreasonableness of the measures adopted against automobilists may be made apparent. The discontent appears to be spreading, and to be directed against the A.C. of America. One prominent automobile contemporary writes as follows:—

> What is the matter with the A.C.A.? What is the matter with its President? First it pre-empts the right actually belonging to the Automobile Association of America to handle America's Gordon-Bennett Race team. It falls down like a provincial croquet club in its efforts to conduct really decisive preliminary trials. Then it assumes the right to champion the cause of all the automobilists of New York State, and, through its President, pledges support for a Bill which is really the worst blow ever aimed at automobiling by a State legislature with any show of passage. The club may not be to blame for its weakness. There are those who declare the censure belongs entirely to Shattuck. If the club is at fault, why? If Shattuck is at fault so persistently, why Shattuck?

OTHER laws throughout the States regarding the speed limit and other restrictions are also helping to a general rebellion against the measures being enforced. Some of the difficulties of automobilists may possibly be imagined when it is stated that most of the Bills seek to restrict the speed "within village limits" to some absurdly low average, and that it is possible for three men to "incorporate a village," and extend the warning signs as to speed to a distance beyond the "village" so incorporated.



THE photographs on this page show a 12-h.p. Halcrow-Vincke petrol omnibus, which is to be used for public service in Norway. The chassis of this vehicle, which has recently been on view at the showroom of Messrs. Laurie and Marner, of Oxford Street—the builders of the body—is one of the standard models made by the manufacturers at their Malines works, in Belgium. It has a 2-cylinder vertical motor, a main clutch of the internal cone type, a change-speed-gear of the usual sliding spur-wheel pattern, and transmission to the rear wheels by side chains. The steering is by rack and pinion, with a vertical steering pillar carrying the wheel. Three forward speeds and a "reverse" are provided, and the vehicle is intended to run at speeds of up to about 15 miles per hour. It has large solid rubber tyres fitted to it. The body is divided into two compartments, the front one, which is tastefully upholstered, being intended for first-class passengers only, and the one at the rear being either for goods or for third-class passengers. The former accommodates 6 people, and the latter about 10. The driver's seat, which is partly protected from weather by carrying the roof forward above it, is situated over the engine. The vehicle weighs about 32 cwt. in running order, and has been designed so that it can be put on the market at a comparatively low price—£400. It is to run in the neighbourhood of Aalesund, where we understand that good roads are available, and that they are, for the most part, level.

IN the German army, in case of mobilisation, those Germans owning motor cars will be liable to have their cars commandeered for a compensation in similar manner to German cyclists and their machines. At the annual meeting of German Army Reservists for the usual inspections, the owners and drivers of motor vehicles were instructed to make themselves known *as such* to the authorities. By this method the German army will be able to create an enormously powerful automobile reserve of almost inestimable value in the event of war.

THE particular make of motor cycle which the Prince of Monaco favours is the Beeston-Humber.

LAST week the Baron de Forest and Mr. J. R. Roosevelt were elected members of the A.C. de France.

"MISS ALIX" will, it is announced, make an attempt to "loop the loop" in Paris at the Olympic Music Hall, using an automobile.

IN spite of the strong organisation formed to recognise the validity of the Selden Patents for America, opposition is already reported to be forming in other quarters to fight the claims made under the patents.

A FLORAL and Decorative Parade in Brooklyn is announced to take place to-day (Saturday) by the Long Island Automobile Club.

THE Grand Duke Michael has accepted the Honorary Presidentship of the Russian Automobile Club, founded about a year ago.

THE price paid by Colonel Pope, on behalf of the Pope Manufacturing Company, for the assets of the American Bicycle Company, is 3½ million dollars.

THE Australian authorities have decided that for the purpose of fixing the amount of import duty, oil and petrol motors for motor cycles will be considered parts of motor cars, and will, therefore, have to pay a 20 per cent. duty on the actual value.

THE National Association of Automobile Manufacturers of the United States have decided against one show only, viz., at New York, next year, as they have now voted to hold a National Show in Chicago. The Association are also considering suggestions for an endurance run during the present year, distinct from the trial under contemplation by the A.C. of America.

Apropos of the numerous police traps set for automobilists in this country, a German contemporary remarks, "What a fortunate country, in which the magnificent police, having once and for all eliminated all the rascals, housebreakers, murderers, and other criminals, can now devote their ample leisure and resources to the sport of automobile-catching."

Owners of automobiles in Washington, D.C., are co-operating to provide for themselves a system for the storage and general care of their cars in one large garage. Each co-operator will be assessed a certain amount per month, and any surplus will be periodically divided up in the shape of dividends to the whole of the owners *pro rata* to the amount they have subscribed.

The managers of the Harvey factory of the Chicago Motor Vehicle Company are "Seventh Day Adventists," whatever that may mean. Their creed has moved them to close the factory on Saturday, the men having to work 10 hours a day for the other five days of the week to make up for it. The whole of the employés have now struck, demanding the regular 9-hour day for six days.

Motor cycles are to be extensively experimented with by the Austrian army during the manœuvres this year, and if found suitable adopted very generally. A number of officers and privates are now passing through a complete course of instruction to ensure the best results being got for the purpose of enabling the heads of the army to judge of their practical value for dispatch carrying, scouting, etc.

The New York Automobile Trade Association, the foundation of which we announced recently, has now elected the following officers: President, Percy Owen (Winton Carriage Company); Vice-Presidents, G. B. Adams (International Motor Car Company) and Alan Whiting (Electric Vehicle Company): Mr. J. E. Plummer of the Locomobile Company of America will act as Secretary and Treasurer.

The Provincial Council for East Flanders (Belgium) has fixed the tax on automobiles at 60 francs for cars of 500 kilogs. and under, 75 francs for those between 500 and 1,000 kilogs., and 100 francs for those above 1,000 kilogs. Thirty francs is deducted from these amounts in the case of automobiles employed in regular public service. Foreigners who reside in Belgium for more than 30 days are also liable to the above tax.

The New York State Association of Automobile Clubs, to which we referred some few weeks back, has now been formally founded, one of the first acts being a resolution to oppose the restrictive legislation now proceeding in the States. The officers appointed are:—President: H. W. Smith, of Syracuse; Vice-Presidents: H. S. Woodworth, of Rochester, N.Y.; J. M. Satterfield, of Buffalo; Dr. W. E. Milbank, of Albany. F. H. Elliott, of Syracuse, will act as Secretary.

President Roosevelt of the United States holds some very strong opinions upon the importance of good roads. At the International Good Roads Convention at St. Louis, recently, he spoke as follows:—"Roads tell the greatness of a nation. The influence of the nations which have not been road builders has been evanescent. . . . This country, which we believe will reach a position of leadership never equalled, should so act that posterity will justly say when speaking of us: 'That nation built good roads.'"

They are a good deal more devoted to spiritualism in Germany than in this country, and a terrible occurrence is reported by a Continental contemporary (not of very serious standing) of an occurrence which recently took place at a séance. After the usual introductory proceedings, a nebulous cloud formed over the heads of the sitters. This, however, was not, we understand, an unusual phenomenon, but when the luminosity condensed itself into the spectre of a cow the astonishment of the participants was extreme. More than astonished, however, in fact terrified to the verge of hysterics, was a young gentleman present, when the bovine apparition pointed at him a denunciatory fore-hoof. He had but a short time previously, in his automobile, run over and killed a cow.

We referred on previous occasions to the way in which the automobile came to the assistance of the public during the recent railway strike in Holland. Some amusing incidents of the situation have since come to light. Some of the Strike Committee themselves wanted to travel from Amsterdam to the Hague. By the results of their own agitation there were no railways running, so they betook themselves to a motor dealer with a proposal to be transported by motor. Recognising them, however, he refused the honour of obliging, and left the strike organisers to ponder upon the advantages and convenience of railway strikes. On another occasion a diamond merchant had to catch a train on the other side of the frontier. It was, no doubt, of great business import to him to succeed in doing so, as he paid £40 to be taken by motor. We trust he caught his train and effected his deal.

Casswell, Ltd., of Gt. Eastern Street, E.C., have issued a very useful trade catalogue of motors and accessories for 1903.

Under the title of the Motor Castings Company, Mr. J. T. Skinner, with whom will be associated Mr. Charles J. E. Rush, has formed a new company, at 101, Gray's Inn Road, to deal with castings, forgings, small bicycle parts, engines, frames, &c., specially appertaining to the motor bicycle. The company will be glad to have catalogues of any manufacturers supplying this particular class of goods.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories either as their principal or part of their objects.]

Durkopp Motoren Gesellschaft (Limited), 3, The Exchange, Muswell Hill, N.—Capital, £100 in £1 shares. R. Asch is first director.

New Kingsland Manufacturing Company (Limited).—Capital, £1,500 in £1 shares. Object, to acquire the business of cycle and motor-cycle manufacturers carried on by J. Austin, at Docwras Buildings, King Henry's Walk, Balls Pond, as the New Kingsland Manufacturing Company.

Sugdens (Bradford) (Limited), Station Court, Leeds Road, Bradford.—Capital, £11,000 in £1 shares. Object, to acquire the business of coachbuilders, spring and axle manufacturers, &c., of G. Stansfield and C. Sugden, Station Court, Leeds Road, and East Parade, Bradford. First directors, G. Stansfield and C. Sugden.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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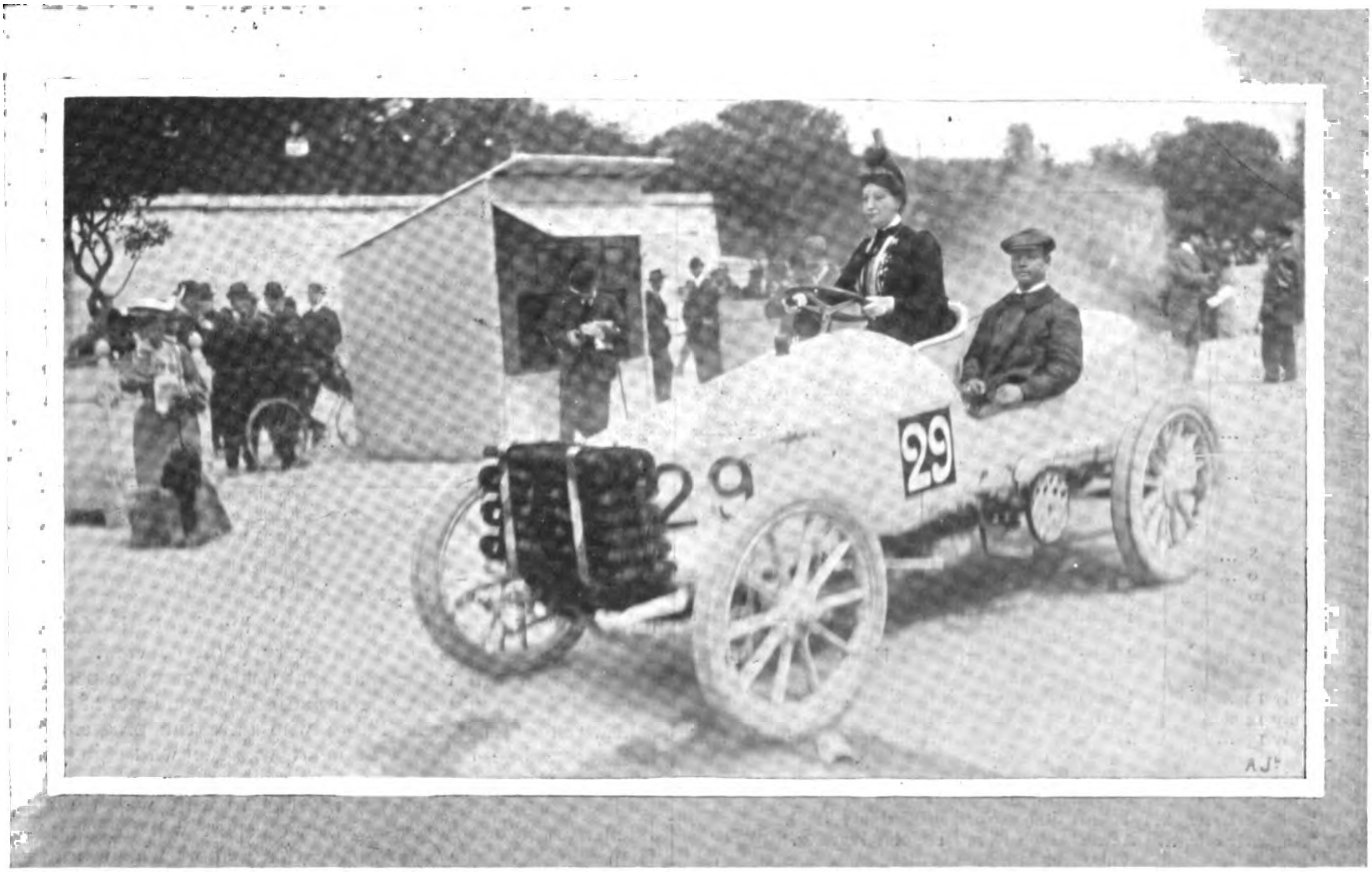

PARIS-MADRID.—Before the Race. Mdme. Du Gast on her 30-h.p. De Dietrich (No. 29) waiting the next turn on the weighing machine. She arrived 63rd at Bordeaux, her net time being 17 hrs. 46 mins. 47⅖ secs.

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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
*June 13 ...		... Gymkhana at Ranelagh.
June 20 ...		... Manchester Auto Club Hill Climb.
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park; Motor Cycle Time Trials; Viceregal Garden Party.
July 6 ...		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy; 4 Mile Motor Cycle Race (Newcastle, co. Down).
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork. Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
*July 24 ...		... 100 Miles Quarterly Trial.
July 24-25		... Southport Speed Trials.
*August 10-22		... Tourist Motor Bicycle Reliability Trial.
*August 22		... Annual Open Race for Motor Bicycles.
*September		... The 1,000 Miles Trial.
1904.		
		... *Light Van Trials.
*Feb. 12-24		... Crystal Palace Exhibition.
May. ...		... Electrical Vehicle Trials (6 days).

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18-28 ...	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20-21 ...	Circuit des Ardennes.
June 28	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 12-19 ...	Ostende Automobile Week.
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16 ...	Race Trelex-Saint-Cergves (Swiss A. C.).
Sep. 6-13 ...	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September ...	Udine Exhibition (Italy).
Oct. 15-21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

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PASSING EVENTS.

PARIS-MADRID.

THE tragic loss of life occasioned by the Paris-Madrid Race is to be deplored from every point of view. The humanitarian will regret that what was in many respects a national fête should have been marred by accidents of such a heartrending nature. Those who have the progress of the automobile industry at heart will see with pain that there is a widespread tendency to exploit these occurrences to the disadvantage of the movement with which their interests are bound up, and lovers of sport will feel that it is in a high degree unfortunate that a sport which brings out some of the highest qualities of endurance, resource, and real courage, and in which, with the exception of a few tragic events, accidents have, until the present occasion, been singularly exceptional, should be seriously compromised and its future threatened by the catastrophes that have occurred. The daily Press very generally, and certain sections of it in particular, have indulged in a perfect orgie of denunciation on the subject. There may be those who regard these outbursts as exaggerated and overdone. In an age which regards war on a colossal scale, with all its unspeakable attendant horrors, for an idea or oftener still a confusion of ideas, as not only permissible but meritorious, the hysterics that have been so widely indulged in may appear to verge on the hypocritical. Material and mechanical progress is a constant battle with the forces of Nature, and it is a battle in which thousands fall every day. The Commission that recently sat on the subject of industrial accidents elicited from its witnesses absolutely appalling figures of the number of porters and shunters that yearly fall victims on our great railways, and it further elicited that the figures published were vastly short of the true returns. We would suggest therefore to some of the able journalists who have flooded the columns of the daily Press with their lamentations over the accidents on the road between Paris and Madrid, that they are wanting in due sense of proportion. In any case, however, the accidents are regrettable in the extreme. They are prejudicing the cause of automobilism, and they are likely seriously to impair the prospects of a sport which has already produced splendid examples of manliness, courage and resource, and might, with proper precautions and management, develop into one of the finest sports the world has yet beheld. It may be worth while to consider, therefore, whether the manner in which races are conducted is not susceptible of some modification that would at least minimise the danger while preserving its useful features.

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WE have not on the previous occasions of the Paris-Berlin and Paris-Vienna races felt called upon to take up a hostile attitude towards undertakings of the kind, for in both these events the accident list was an amazingly small one. Even as compared with last year, however, the number of spectators along the line of route increased enormously, and the increase of car power, and consequently of speed, and above all in the number of competing cars, has been even greater. The accidents which good management and probably good fortune avoided previously have taken place on the present occasion, and on a really tragic scale. Probably the increase in the number of cars, with the consequent necessity of starting a competitor every minute (and the motor bicycles in pairs), was the most powerful contributing cause. Whatever the cause or combination of causes may have been, however, there is no doubt that neither the people nor the authorities will tolerate another race on anything like the same lines.

THE position at present is much as follows :—Every car successfully competing in a great Continental race provides the most paying form of advertisement for the firm that built it. It is not a little difficult to understand why this should be so, for there is no real connection between the two things. The element of chance comes in so largely, and there are such differences of skill between the drivers, that the excellence of the car is by no means the only factor, besides which a firm might devote all its energies to the construction of a few first-class racers and remain all the time almost novices at building ordinary commercial or touring cars. One point also must not be forgotten. High-powered racers are capable of taking almost any hill on the top speed. Only exceptionally, and for short intervals, do they employ their lower gears, and this alone discounts seriously the value for ordinary car-building of experience gained in their construction. The public, however, seems determined to buy from the firms that win the races, and no motor car builders—whatever their position—can, consequently, afford to neglect races, as long as races are held. If they hang back others will press forward, and the popular favour which was theirs will be bestowed on others.

AT the same time it is worth while considering whether road races could not be so organised and managed as to afford constructors the publicity and advertisement which they need and desire, to minimise and even practically eliminate danger to the drivers and the public, and above all to afford possible and intending purchasers a much better and more satisfactory guide in selecting the firms from whom they decide to purchase their vehicles than is afforded by road races as hitherto arranged and exemplified by either the Paris-Berlin, Paris-Vienna, and above all Paris-Madrid contests.

THIS might be done, as far as petrol cars are concerned, by the adoption of a proposal that has already been put forward in the case of motor bicycle races, that is to restrict the total piston displacement of the engines. This means that the competing cars will be to a large extent limited as to power and speed. Differences between cars will then depend on such questions as the successful maintenance of reasonably high-compression, the perfection with which the cylinders are synchronised, and the satisfactory working of such parts as carburettors and ignition apparatus. The actual engine-speed maintainable will also depend upon perfection of construction. The engine that continues running fastest for a reasonable length of time is the best engine, and the eventual purchaser would not, in practice, run it at racing speed, and so under ordinary working conditions its life would be prolonged. Apart from the power developed by the engine the speed of the car will depend on the all-round efficiency of the transmission. Such a proposal only applies, of course, to petrol cars with change-speed gearing. Special provisions would have to be adopted in the case of steam vehicles and of any petrol cars which may in the future dispense with any change-speed gearing.

IF such restrictions were imposed it would be easy to ensure that the average speed of the race would never be dangerously high. Of course competitors might fit the lightest bodies they chose. But otherwise they would be racing with machines corresponding to ordinary touring requirements, and the results would prove a real guide to the purchasing public, and would unquestionably afford indications of which were the best cars, for the difference between racing strain and ordinary touring conditions would make up the difference.

To minimise danger resulting from overcrowding, to say nothing of the greater fairness to all contestants, a maker should, we think, be restricted to entering two vehicles only of the same type. There is no real objection to such a course, in fact, unfairness results from allowing manufacturers too many strings to their bows. This would at present reduce the number of entries to more reasonable proportions, and so permit a longer time interval between the startings, thus diminishing the amount of dust and its serious attendant dangers.

AND THE GORDON-BENNETT.

THE Automobile Club has very wisely addressed a circular to the Press generally, pointing out the great differences between the Paris-Madrid race and the approaching Gordon-Bennett event, leaving the very natural conclusion to be drawn that there is not the slightest reason to apprehend the occurrence of dangerous accidents in the contest that is about to take place in Ireland. It is pointed out in the first place that such a length of road as that between Versailles and Bordeaux could not possibly be adequately patrolled. The Irish course, however, is only 93 miles round, and there will be upwards of 7,000 police officers, assisted by the Club stewards, to keep the public off the road. Again, not one of the competitors in the Paris-Madrid race could really know the road in detail. When the race comes off in Ireland every one of the competitors will have been over the course dozens of times, and will know every corner of it practically by heart. But, above all, the great difference in favour of the Gordon-Bennett is that there will be only 12 starters instead of the 216 that were let loose on the Bordeaux Road on Sunday last. And they will be started at much longer intervals, while, as they are all cars of much the same calibre, there will be comparatively little passing and re-passing. The competitors for Paris-Madrid included all sorts and conditions of cars and motor bicycles, and they frequently passed and repassed one another; while, as they were so close together, a practically continuous cloud of dust, rendering steering difficult and dangerous, overhung the whole of the route. On the Irish course the roads are being tarred near the corners, so that the competitors will not have to reckon with dust in negotiating them. It must be remembered that with the fewer numbers that started in Paris-Vienna and Paris-Berlin, there were no fatal accidents during the running. We may look forward to the Gordon-Bennett Race, therefore, with confidence, and we may also be thankful that the enabling Bill having been passed through Parliament, it is not within the power of a single Minister n a fright to interdict it.

ONE unfortunate result of the serious accidents which have taken place in the Paris-Madrid race is that the daily press of this country has not only, as we have elsewhere noted, adopted, in many instances, an hysterical attitude on the subject of motorism, and motoring generally, in its editorial columns, and has in several cases made a deliberate and disingenuous attempt to prejudice the legislative question by appeals to the popular resentment which the accidents have given rise to, but has also opened its columns to correspondence couched in an even more exaggerated strain. We refer particularly to the preposterous letter, a column and a half long, which has appeared in the *Daily Telegraph* over the signature of "Rusticus." Seldom has a more complex tissue of misrepresentation, exaggeration, and positively false suggestion been incorporated in the pages of a single newspaper. "Rusticus," who poses as a lover of the country, would have us believe that there are roads in the near neighbourhood of London in which practically a perpetual motor race is going on, and he demands not only the restriction of speed, and numbering, but that motor cars should carry huge numbers on both sides. If the Paris-Madrid race had taken place in the dog-days, we could perhaps understand lucubrations of this kind. "Rusticus" is anxious to dam back the stream of progress and he seems to think it can be done. It will go on flowing, however. "Rusticus expectat dum defluat amnis at ille," &c.

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THE POSTAL VOTE.

THE results of the postal vote on the legislation question have now been received, and have been published by the Automobile Club. We are glad to say that the result is a triumphant majority for the Legislative Committee's proposals as embodied in the Bill entrusted to Mr. Scott Montagu. We have throughout supported the general lines of the Legislative Committee's Bill, and we feel, therefore, that as far as our influence has made itself felt, it has tended to secure the marked majority on which the members of the Legislative Committee, who have so ably formulated the proposals on which the vote was taken, may congratulate themselves. The vote in favour of the Club's proposals showed a majority of about 2½ to 1. Lord Russell's suggestion has been negatived by a majority of practically 2 to 1, while the votes on question two showed a majority of approximately 3 to 1 against the banal suggestion of doing nothing and allowing matters to drift as they are. The situation, therefore, is highly satisfactory on the eve of the introduction of the Government measure. It strengthens the hands of those who will practically be representing the interests of automobilism in the House. And the small number of votes in favour of Lord Russell's proposals will, to all practical intents and purposes, prevent the reproach being made that automobilists as a body do not know what they want, and won't be happy till they get it.

THE amended Bill of the Legislative Committee, which we published last week, will be introduced at an early date, probably next week, into the House. Of course, it is not intended to press the Bill through, but merely to put it on record as a statement of what in the future is required by the great majority of automobilists for the progress of the industry, and by the general public for safeguarding their real interests. We pointed out last week that the amended Bill recognises the necessity of protecting motorists on much the same lines as those which we have always advocated. It does not, however, in our opinion go quite far enough as regards the necessity of requiring independent evidence to confirm the evidence of prosecuting policemen. The necessity of this is recognised, but it apparently is restricted to the mere matter of policemen calling upon a car to stop. We think it of the highest importance that this should be carried further, and that independent evidence of the police evidence on the other points in the charge they make should be required. We cannot too strongly insist upon the necessity of this provision, and we do so now once more, even at the risk of undue reiteration, owing to the critical condition of the question and the imminence of Government legislation on the subject.

BY arrangement with Mr. Long, Lord Balfour of Burleigh, the Secretary for Scotland, has been able to state that it is proposed to introduce what we may term the Motor Car Reform Bill in the House of Lords in the first instance. This will probably be in some respects a more expeditious way of bringing the proposals forward initially, and, at any rate, when the Bill arrives in the Commons, those interested will know what the Lords are prepared to assent to. We are not altogether sure, however, that as a matter of tactics it would really expedite matters. In spite of its conservative complexion the House of Commons is not very partial to measures of wide public interest coming to it from the Upper House, and in such cases the Bill is often subject to more criticism and opposition than if it were introduced in the Lower House first. It may be that nothing of the kind will occur in the present instance, and we hope it will not. We merely refer to the fact in order that those interested in, and in charge of, the Bill in the House of Commons may exercise greater tact, diplomacy, and watchfulness with regard to the measure, should any evidences of this feeling present themselves.

That there are very strong opponents of the proposed reform in the House of Commons was shown by the remarks of Mr. Weir and Mr. Wason. Mr. Wason wanted to "set the Attorney-General in motion" in reference to the supposed breaking of the law by the competitors in the Glasgow to London Non-Stop run. When the Attorney-General referred him to the local police, Mr. Wason explained that he had raised the question on account of the "cruel" manner in which the police had been ridiculed on the subject. Unfortunately for Mr. Wason, the Attorney-General only smiled. Mr. Wason, it appears, is opposed to Mr. Long's coming Bill, because he is of opinion that it would be highly dangerous to allow traffic on roads to proceed at divergent speeds. What a sample of the wisdom of our legislators! On what road in the kingdom, we should like to know, has Mr. Wason found even hippomobiles going at uniform speed, to say nothing of donkey carts and perambulators? Mr. Weir requested the Home Secretary to take action because he himself (Mr. Weir, not the Home Secretary) had been *very nearly* knocked down by a motor under the sacred shadow of the very Houses of Parliament. The Home Secretary was evidently in a somewhat satiric humour, for he intimated that in so grave a matter as that he could take no action. After which Mr. Weir, evidently irritated, suggested that the police should in future be armed with lassoes for the purpose of capturing refractory motorists who presumably come too close to Mr. Weir when on the way to perform the Parliamentary duties with which the irony of events has entrusted him. Mr. Weir may at any rate congratulate himself that he has afforded the *Daily Graphic* material for an extremely entertaining cartoon illustrating the application of his lasso in practice. Mr. Weir is not an Irish member, or we should be inclined to think that he had taken a wrinkle from the bad old days when those who did not wish to waste powder and shot on Irish landlords used to stretch a wire across the road on which they were likely to drive home at just the right height to catch them in the neck. Perhaps Mr. Weir would like to see this measure also adopted for the better disciplining of motorists.

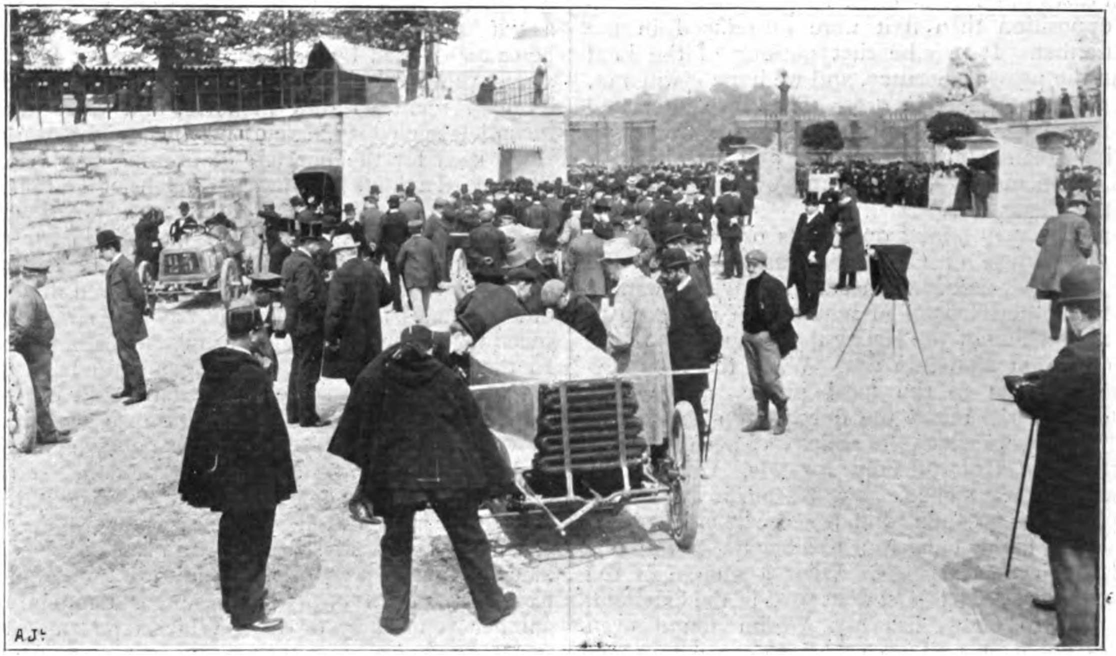
THE TRAILER QUESTION.

NEXT to the actual speed limit for ordinary cars, there is probably nothing that occasions more irritation to the automobile world than the absurd manner in which the Local Government Board regulation in regard to trailers is administered. In the present regulations one vehicle towing another is not permitted to go at a greater speed than six miles an hour. Although some magistrates have taken a different view, it has, in general, been the custom to regard a motor bicycle drawing a light trailer as coming under this regulation. It is highly desirable that the matter shall be put on a satisfactory basis by the legislation which is at present contemplated. We do not feel sure that this would be adequately effected by the proposed Bill put forward by the Legislative Committee which we published last week. According to Section 4 of this Bill, "Vehicle" shall mean and include any vehicle referred to as "light locomotives" in the principal Act, or as may be hereafter defined by the Local Government Board, as well as any vehicle propelled by power if it is designed to carry its load upon its own platform, and does not exceed, including such load, a total moving weight of 14 tons, or when used for the purpose of drawing one vehicle, does not exceed a joint total moving weight of 20 tons. Even supposing this section is adopted in any Act passed, the Local Government Board will probably have power to make, or at any rate may make, special regulations in regard to trailers limiting their speed, even though that of other vehicles is not limited, just as they have reduced the speed for trailers under the existing Act from 12 miles to 6. In the case of heavy vehicles going up to a combined weight of 20 tons some restriction would be reasonable enough. What is wanted is that a clause shall be inserted by which a motor bicycle or tricycle drawing a light trailer shall be exempt from any such restriction. It is exceedingly light, is easily controlled, and would be little likely to produce accidents at high speeds, so that unless some provision of the kind suggested is made, serious injustice may be done to a very popular form of conveyance. The case, too, of an ordinary car either temporarily towing another vehicle, or of light vehicles generally acting as tractors with trailers attached, ought also to be provided for. It was evidently the intention of the framers of the proposed Bill to do this, but it does not appear to us that this is adequately effected by the phraseology of Section 4.

THE CYCLIST AND THE MOTOR.

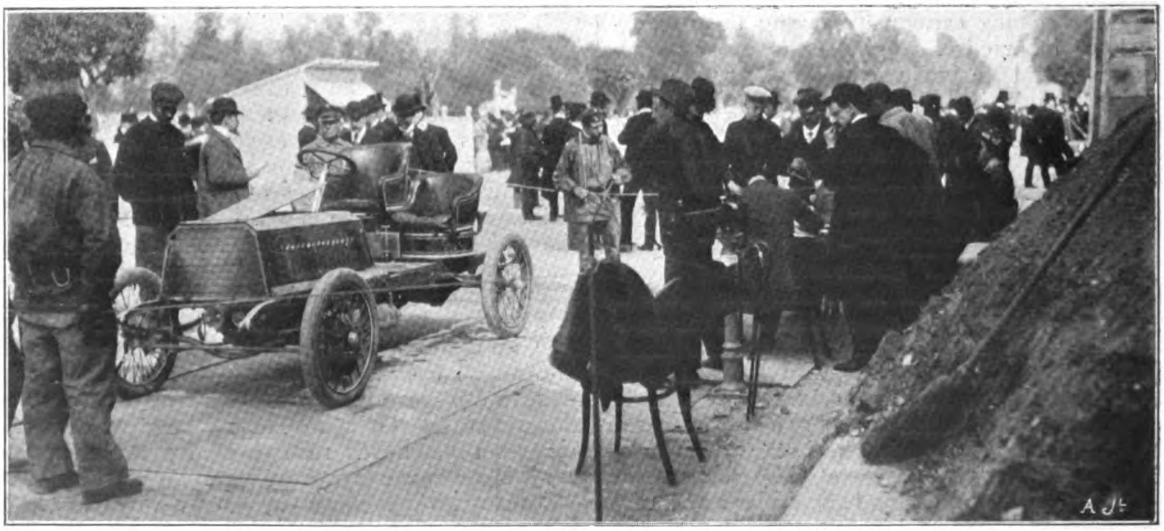
THERE is no doubt that excellent feeling has prevailed hitherto between the light cavalry of the high roads and their more weighty colleagues—the automobiles. The cyclist has proved himself an admirable ally of the automobilist, at any rate as regards police traps. Many and many an automobilist has been saved from fine and impertinence in police courts by the friendly warnings of cyclists in Surrey and elsewhere. No doubt the cyclists themselves have so long suffered from the unwelcome attentions of the police that they are anxious to co-operate with any class of road-users who are threatened by their ancient enemies. Whatever the cause of the friendly feeling may be, however, it would be a distinct misfortune if it should ever diminish, and it is on that account that we feel bound to raise a protest against the occasional want of consideration which is shown by automobilists on passing or meeting cyclists. They often run them painfully close and the rush and storm of wind and dust that an automobile at high speed occasions is extremely disconcerting even to the experienced cyclist. We feel sure that this is merely want of thought on the part of most drivers and that the matter only needs to be mentioned to be remedied. At the same time, we would like to again draw attention to the foolish habit which has grown up amongst cyclists, that of riding along at top speed in the rear of a fast car, and sometimes alongside of it. Of course, they get a great deal of assistance from the onward rush of wind that the car produces, but it is a dangerous proceeding and if anything causes the car to slow up suddenly an accident is very likely to happen to the cyclist riding behind, while those who flank the car are an absolute danger both to themselves and other vehicles.

PARIS-MADRID RACE.

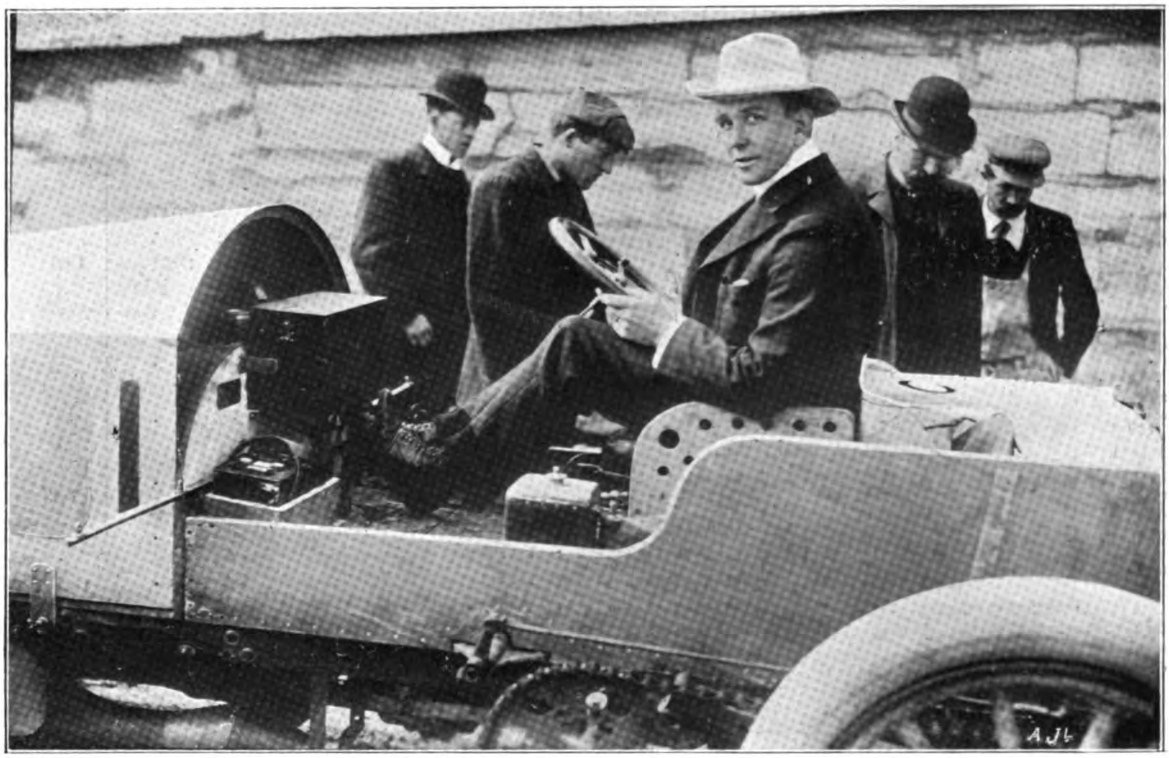


Paris-Madrid.—General view of the weighing enclosure. In the foreground in the centre of the picture is Mr. Charles Jarrott's No. 1 car, with Mr. Jarrott standing on the right. On the left will be seen M. Tourand's Brouhot car (No. 23), which subsequently caused such a lamentable accident at Angouleme.

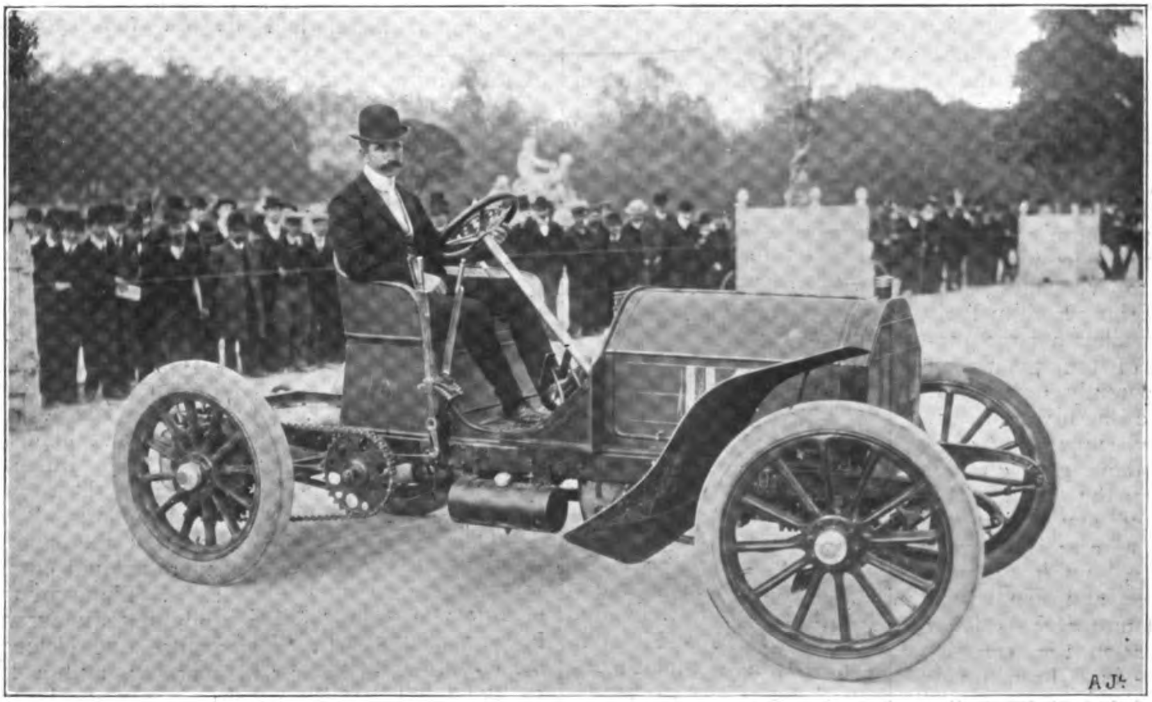
EACH year that elapses sees the annual great race, which for three years past has started from Paris, the centre of more general interest, greater enthusiasm, and even more tremendous crowds. Large as were the crowds which assembled last year at Champigny to witness the start for the Vienna race, they were greatly exceeded by those which assembled in the grey dawn of Sunday last almost under the shadow of the Palais at Versailles to witness the start for Paris-Madrid. Even at 5 o'clock on Saturday afternoon crowds were *en route* for Versailles. Not since the Revolution has such an exodus of Paris to the neighbouring town taken place. On foot, in cabs, on bicycles, in motor cars, all Paris turned out. The number of cyclists alone has been estimated at from 50,000 to 100,000, the throngs of motor cars, quite independent of the racers—and their number was not small—was prodigious; and as for ordinary citizens,



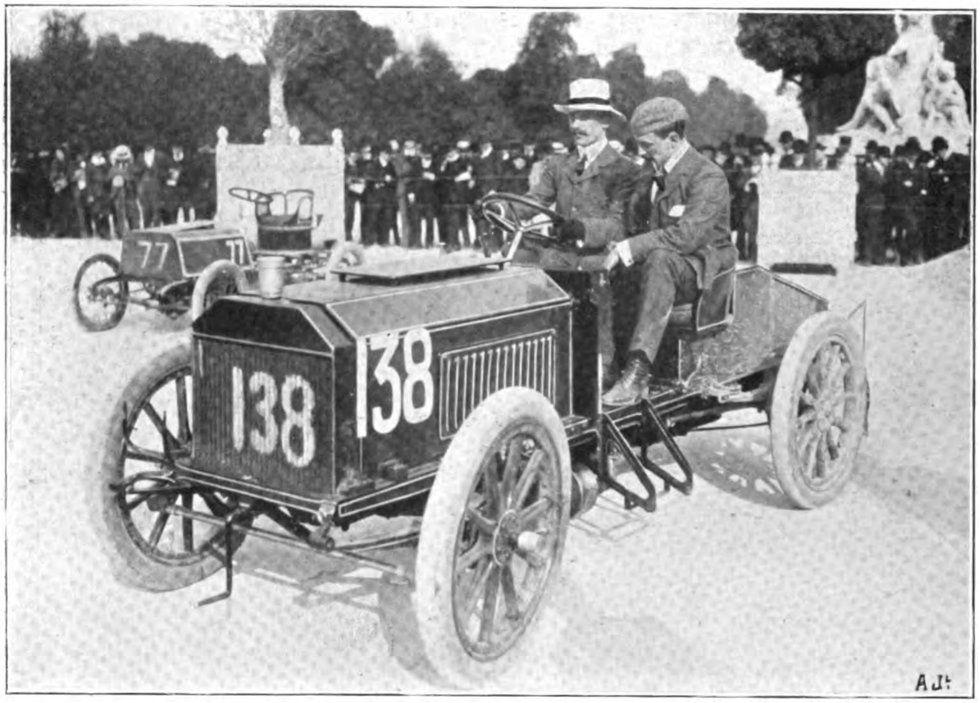
Paris-Madrid.—A racing Darracq car on the weighing machine. The Judges and Officials are seen on the right of the picture.



Paris-Madrid.—In the weighing enclosure, Mr. Charles Jarrott (No. 1) on his 45-h.p. De Dietrich car. "Get there first? Well, I shall do my best," said Mr. Jarrott.



Paris-Madrid.—Mr. Foxhall Keene on one of the Gordon-Bennett Cup Mercedes cars. Mr. Keene is the third driver nominated on behalf of the German Club for the Gordon-Bennett Race, and is taking the place of Werner, who has had to be passed over in consequence of the rules of the German Club not rendering him eligible to become a member, a necessary preliminary to driving on behalf of any of the recognised Clubs in the Gordon-Bennett Race.



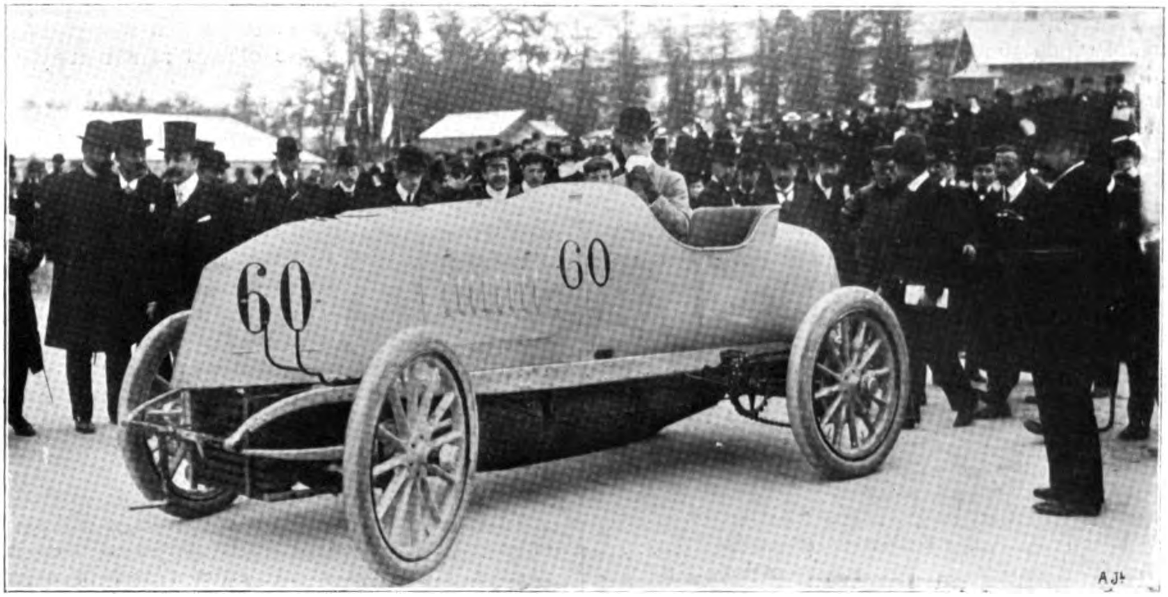
Paris-Madrid.—Mr. Mark Mayhew on his Welbeck Napier car (No. 138) waiting to be weighed. Mr. Mosses, who acted as his mechanician, is by his side. On the left, in the background, is M. Villemain's Darracq car (No. 77).

walking, driving, getting there how they could, no one could count them.

There was more enthusiasm, more good nature, and greater sympathy with the racers than the year before. The "gamin" element was not so obstreperous, and though last year the car drivers were looked on generally with respect, they were treated by the general public with even more consideration on this occasion. The exodus to Versailles went on all night. Both in Paris and Versailles a large proportion of the population had apparently determined to make a night of it. They had supper, and after supper they got on the road for the start. The places of amusement in Versailles are not very numerous, but they were all full and so were the restaurants, and if on this occasion the capacity of both had been quadrupled, there is no doubt that there would have been no room to spare in them, for it is one thing to enjoy oneself and sup in Paris and then start for Versailles, another to take your supper there, and be on the spot for the start.

Paris-Madrid.—The Hon. C. S. Rolls returning from having his 70-h.p. Panhard (No. 59) weighed. Mr. Crompton, who acted as his mechanician, is seated by his side.

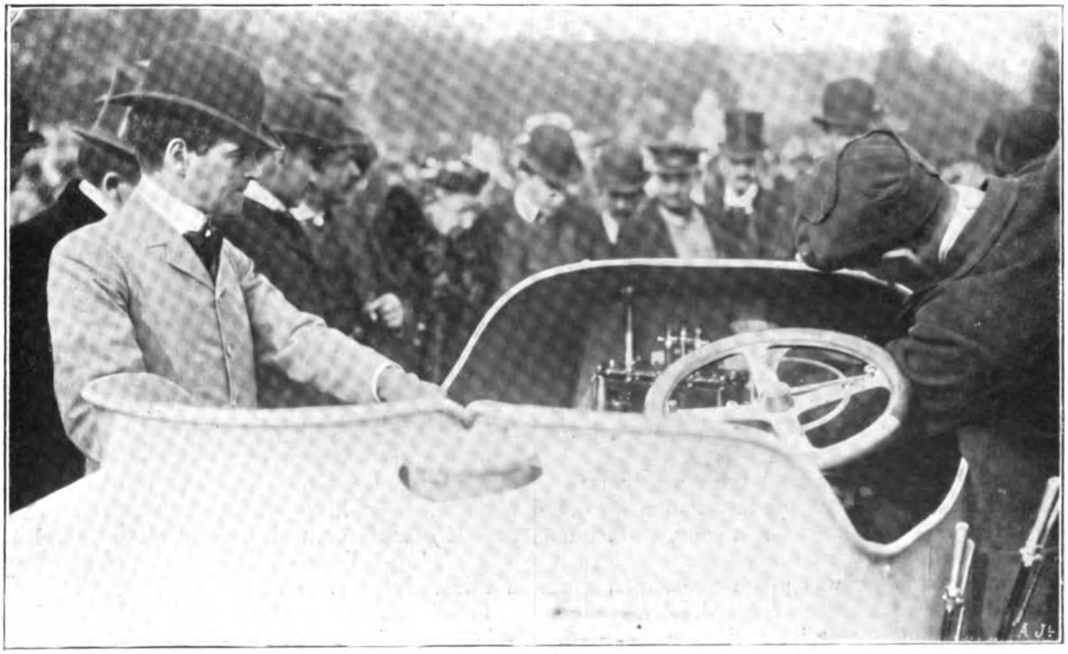
The weighing operations which started on the 19th inst., extended up to mid-day last Saturday, when the last to pass the scales was a 16-h.p. light Boyer car (No. 305). The scene at this spot was one of continuous animation. To name the automobile and other celebrities who were at one time or another witnesses of the operations would mean giving a list of almost every known man in the motor world. The weather was perfect and almost seemed as if the fringe of the American heat wave had reached Paris. This helped to swell the concourse of interested and curious sightseers. Many of the racers did not get under way much before one o'clock in the morning, and a large proportion came by way of the Arc de Triomphe and ran through the Bois de Boulogne and Suresnes in the dark hours that precede th



Paris-Madrid.—Mr. W. K. Vanderbilt, Junior, and his 70-h.p. Mors car (No. 60).

dawn. As in this country so in France, the cyclists have constituted themselves the allies of the motorists, and most of the cars were escorted on the way by an enormous bodyguard of the light cavalry, who added to the picturesqueness of the scene with their Chinese lanterns, most of which were of different colours, and lunch and bottles of wine in many cases strapped across their backs. Versailles itself was brilliantly illuminated in honour of the event, though the effect was obscured by the amount of dust thrown up by the cars themselves and the general traffic, and matters occasionally looked decidedly dangerous, for some of the racers elected to do without lamps.

On the low speed, they made—as most racers do—a considerable noise, so that the crowds got out of their way satisfactorily, and they generally kept to low speed through the dark Bois de Boulogne. When, however, they reached the Octroi near the Orangery, in many instances they let themselves go and shot off in the direction of the starting



Paris-Madrid.—Mr. W. K. Vanderbilt, Junior, personally superintending adjustments on his Mors car.

point at a distinctly high rate of speed. The total number of starters was 223, comprising 138 heavy and light cars, of which 76 arrived at Bordeaux; 32 voiturettes, 21 arriving; and 53 motor bicycles, 13 arriving at the end of the first stage.

The heavy and light cars were sent off first at intervals of a minute; then the voiturettes, and finally the bicycles in pairs. A maximum time of 24 hours was allowed to cover the distance to Bordeaux. Competitors were not permitted to accept the assistance of outsiders to effect repairs or replenishments. These had to be carried out in the "running time" by the driver and his assistant. By this method the absurd rule pertaining in previous contests was overcome, which allowed manufacturers to have small armies of assistants scattered along the entire route ready to remedy any possible mishap.

Eight competitors pinned their faith to alcohol as a fuel, the special prize of Prince Arenberg's being allotted to this section. This fell to Rigolly on one of the new 100-h.p. Gobron-Brillié cars, No. 219. The other drivers using the same fuel were:—R. de Knyff (Panhard, No. 2), Tourand (Brouhot, No. 23), Baras (Darracq, No. 4), Taveneaux (Gobron-Brillié, No. 70), Kœchlin (Gobron-Brillié, No. 82), Fraignac (Gobron-Brillié, No. 194), Duray (Gobron-Brillié, No. 225), and Rophe (Darracq, No. 288).

At the starting point two ornamental masts, festooned with the national flags, had been erected, and here the crowd was at its thickest. The time of starting was a quarter to four, and a few minutes before that hour Mr. Jarrott, who had drawn the place of first starter, swept up to the line. The French populace on this occasion showed themselves to be sportsmen in the best sense of the word. In spite of Mr. Jarrott's nationality he was cheered to the echo, and no more enthusiastic reception was given to any competitor of French nationality. As Jarrott reached the starting point a tremendous explosion occurred that made even him jump, and the effect on the spectators was decidedly marked. It was not a car which had blown up, as some of the spectators seemed to imagine; it was only the signal given by a mortar for the competitors to get ready. As soon as the nature of the explosion was recognised, people remembered it was to be followed in five minutes by another, and got ready to hold handkerchiefs and other things to their ears. Before the starting time Mr. Jarrott was given a minute to collect himself. He drew his mask over his face and waited. In strange unanimity the surrounding crowd grew perfectly silent. Nothing could be heard but the beating of the engine in his powerful De Dietrich car. Perfectly calmly and gently his foot pressed on the pedal, first he moved one lever and then another, and like an arrow from the bow away shot the car on the first stage of the long road to Bordeaux. The sounds of his departure were lost amid thunderous cheers, and were signalised unfortunately by enormous clouds of dust.

The cheers were scarcely over and the dust had not subsided before M. René de Knyff's 70-h.p. Panhard came up to the line. He was stolid and almost grim, and it was as well, for he had much less time to collect himself than Jarrott. In a few seconds he was given the signal and started at apparently an equal rate of speed. The others followed with perfect regularity at intervals of one minute. It was a marvel of organisation. There was not a hitch. Each car was in position, each car moved up to the line with almost mathematical precision, and each started at its highest speed precisely as the signal was given. In fact, they shot off one after the other like a battery of artillery firing by sections.

Of course, the throng present, though predominantly French, was to a large extent international. Whatever their nationality, they all seemed to entertain the same sympathy for the pluck displayed by the one lady competitor in taking part in what was the most crowded race, and consequently the most dangerous, that has hitherto been held; Madame du Gast received a veritable ovation.

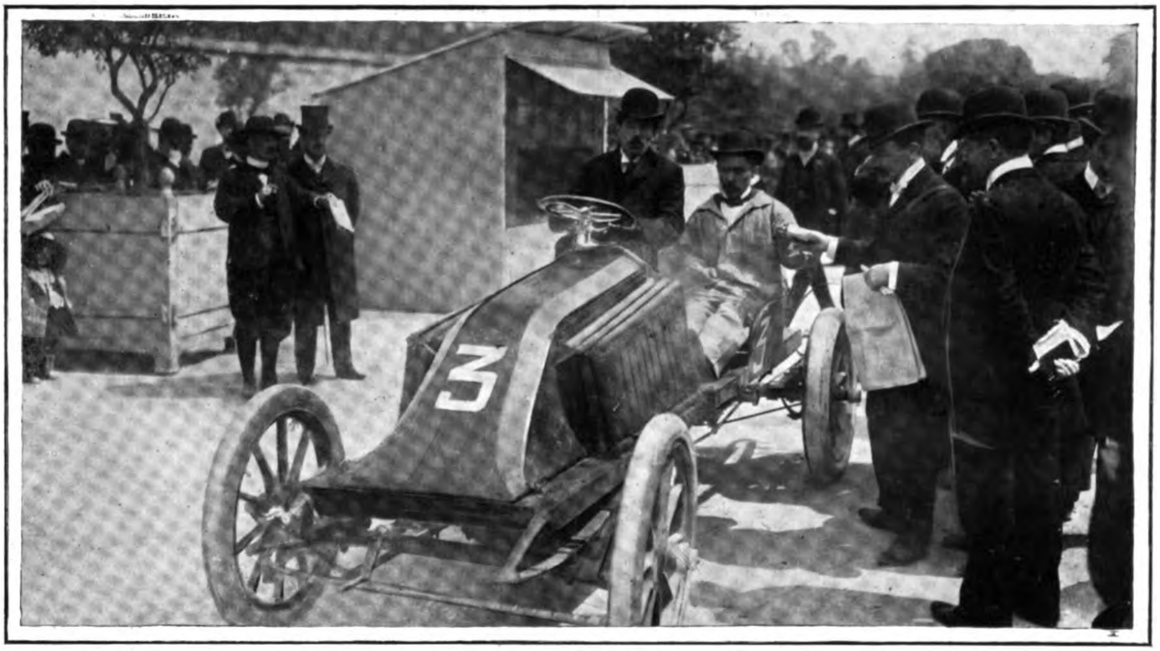
All the way as far as Rambouillet the sides of the road were crammed with spectators, in some places five or six deep, and here, as elsewhere along the line of route, particularly at the entry to Bordeaux, they occasioned the competitors considerable trouble and were a source of distinct danger. The military did excellent service in keeping the crowd within bounds, and diminishing the danger of the actual number of accidents that occurred, but though cuirassier regiments in the neighbourhood of Versailles, at Rambouillet, and at the arrival at Bordeaux, and at important points along the line, supported by regiments of the line, attempted to keep the crowd in check, their success was only partial.

After the start of the first competitors a considerable number of non-competing cars, cyclists and motor cyclists made a rush to attain a point on the road where the racing cars could be seen passing at full speed, and succeeded in debouching on the road of the race at various points, notably Trappes and Rambouillet. In the village of Trappes there is one of those villainous gutters which are such a nuisance to automobilists in France, and the racing cars as they encountered it bounded up, some of them nearly three feet, into the air. The jump and shock was too much for one of the Serpollets, possibly owing to the structure and position of the generator, and soon after it had, as a result, to retire from the contest. But most of the first starters were going well, and Madame du Gast, with several bouquets dangling from her car, was wildly cheered as she swept by.

Practically all the towns and important villages, commencing with Rambouillet, were neutralised, and here the local cycle clubs rendered yeoman service in piloting the cars through the controls. On the outskirts of the controls, too, large numbers of spectators had assembled.

At Rambouillet, Rene de Knyff had overhauled Jarrott, who was following him closely, pursued in turn by Renault, and then by Thery and Werner, all these cars running with but a short interval between them. There was a slight slowing up at the sharp and rather dangerous corner at Ablis, and then down the long, straight, rolling, switchback road from Ablis to Chartres, with the double towers of the cathedral looming up in the distance, the pace was tremendous. At Chartres, Louis Renault was leading and entered the control at 41 mins. 40 secs. past 4, followed closely by Jarrott 2 mins. 50 secs. later. Jarrott had here overhauled de Knyff, behind whom came Thery, and 9 mins. after him Madame du Gast, who arrived at the Chartres control exactly at 5 o'clock, Maurice and Henry Farman arriving 5 mins. 43 secs. and 8 mins. 27 secs. later, respectively.

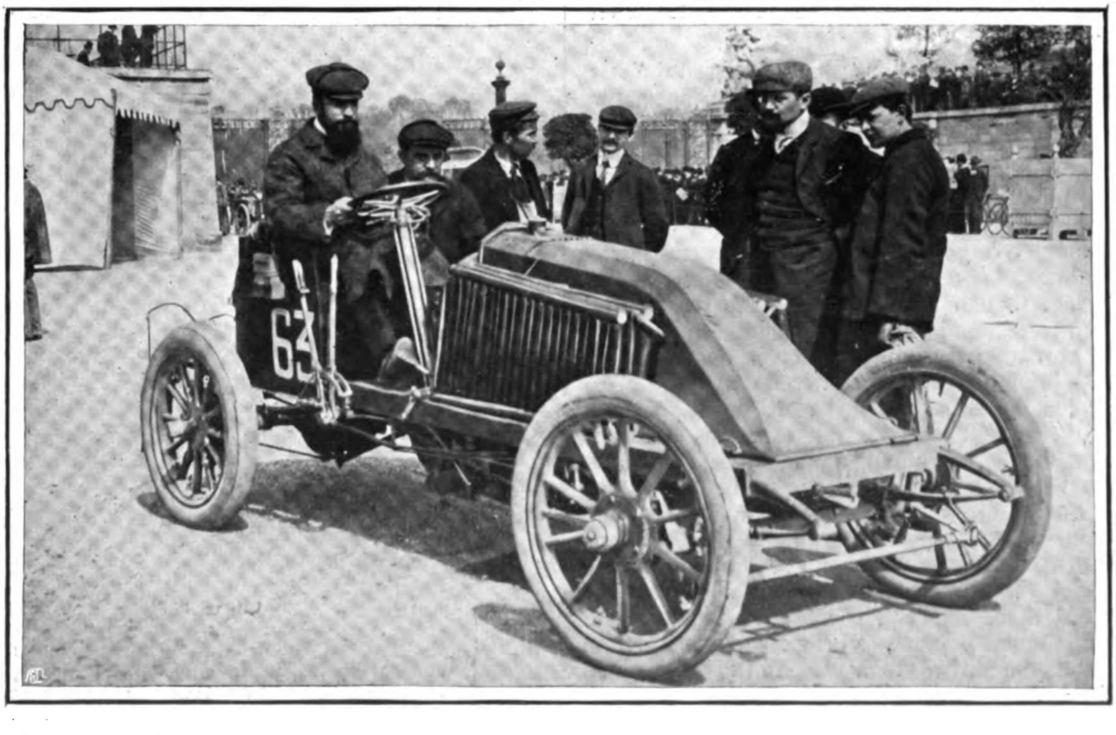
From this point cars began to fall out rapidly, and at Chateaudun there are two bad crossings at which several cars got into difficulties. It will be remembered that it was here in the 1901 Bordeaux race that no less than



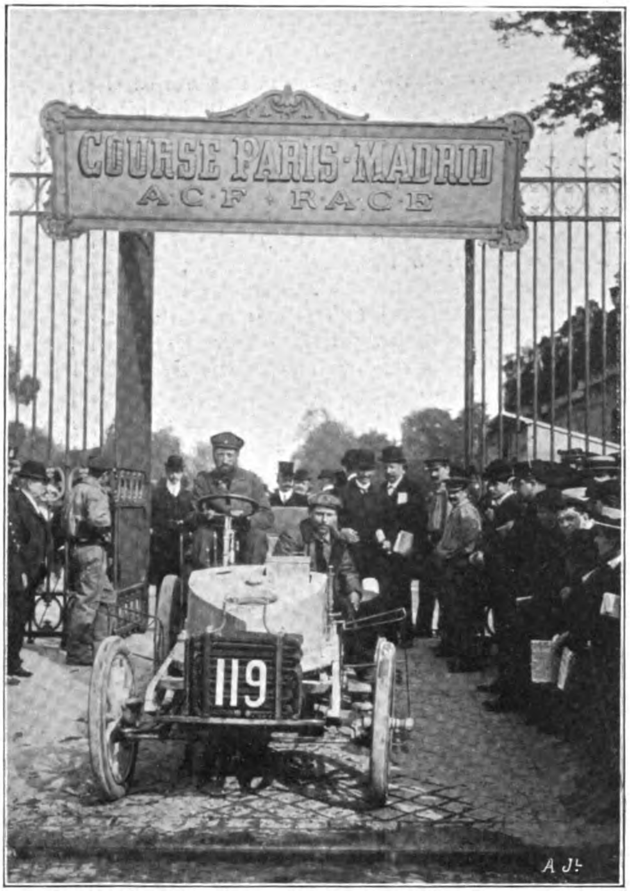
Paris-Madrid.—M. Louis Renault (No. 3) on the Paris weighbridge. He started 3rd from Paris and was the first to arrive at Bordeaux. Net time, 5 hrs. 33 mins. 59 secs.

three cars were smashed up. Each section of the road onward now claimed its share of breakdowns, so that along the whole route to Bordeaux cars *en panne* were to be met with. From Barbezieux to Bordeaux almost the whole of the road is extremely bad and dangerous, there being numbers of turns, angles, and crossings without cessation, and here and in the neighbourhood of Angoulême most of the accidents which we refer to separately occurred.

The masses of people that had collected at Bordeaux to witness the arrival of the cars at the control at the Quatre



Paris-Madrid.—M. Marcel Renault immediately after complying with the weighing in formalities. M. Renault during the race came to unutterable grief, and succumbed to his injuries on Wednesday morning last. Last year M. Renault was the winner in the Paris-Vienna Race.



Paris-Madrid.—Le Blon quitting the weighing enclosure on his 40-h.p. Serpollet steam car (No. 119).

Pavilions were only less enormous than witnessed the start from Versailles. By train, by car, and by cycle, spectators had been pouring in all through the night. Enthusiasm and animation prevailed everywhere. The excitement reached a climax as Louis Renault, at just a quarter past twelve, dashed up to the control amid a perfect storm of applause, looking none the worse for the severe strain of the tremendous race of 342½ miles. He had passed Jarrott between Rambouillet and Chartres, and kept ahead all the way to Bordeaux, though immediately in his rear Jarrott and Knyff had passed and repassed one another more than once. Jarrott arrived next, approximately a quarter of an hour later. Gabriel, however, who arrived on his big Mors at 1 hr. 8 mins. 46 secs., did not start until 5.1 a.m., having drawn No. 168, and his net time was therefore 5 hrs. 13 mins. for the 552 kiloms. (342½ miles) separating Versailles from Bordeaux, after allowing for neutralisations (33½ miles; time, 2 hrs. 54 mins.). This gives an average speed of about 65 miles per hour, and beats Fournier's record of 6 hrs. 11 mins. between the two cities, and constitutes Gabriel the winner for this stage. Fournier's previous record time, however, it must be remembered, included an additional 8 miles, as his start was made from Suresnes. The other arrivals took place in the order which we append below.

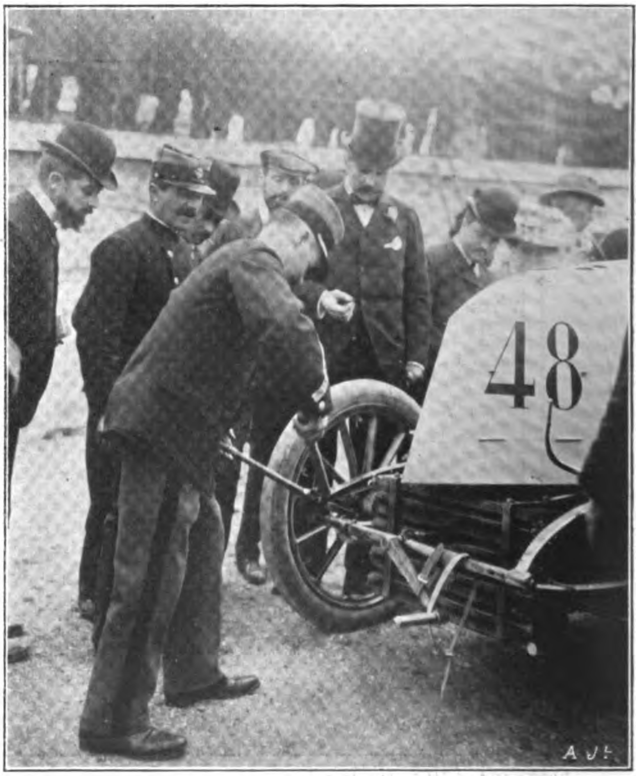
The honours of the day were in general with the heavy Mors, De Dietrich and Mercedes vehicles, though as in the Paris-Vienna race the light Renault showed that it could well hold its own with the heavier cars. The Serpollets, too, though not getting high places ran well, with the exception of the one that came to grief at Trapps, and two of them got fairly good places.

The C.G.V. cars also behaved very well. The great 80-h.p. vehicle with which M. Charron had intended to contest the race was not ready in time for the start, so a 15-h.p. tourist car, which had been running on the road for a year, was entered instead of it, and, carrying M. and Madame Charron and a considerable quantity of luggage, arrived at Bordeaux 30th in his class. M. Voigt also successfully drove a 40-h.p. C.G.V. car. He started No. 153, but arrived 10th at Bordeaux, having made the sixth best time on the road, the 342½ miles being covered in 6 h. 1 min., and 100 cars having been passed *en route*.

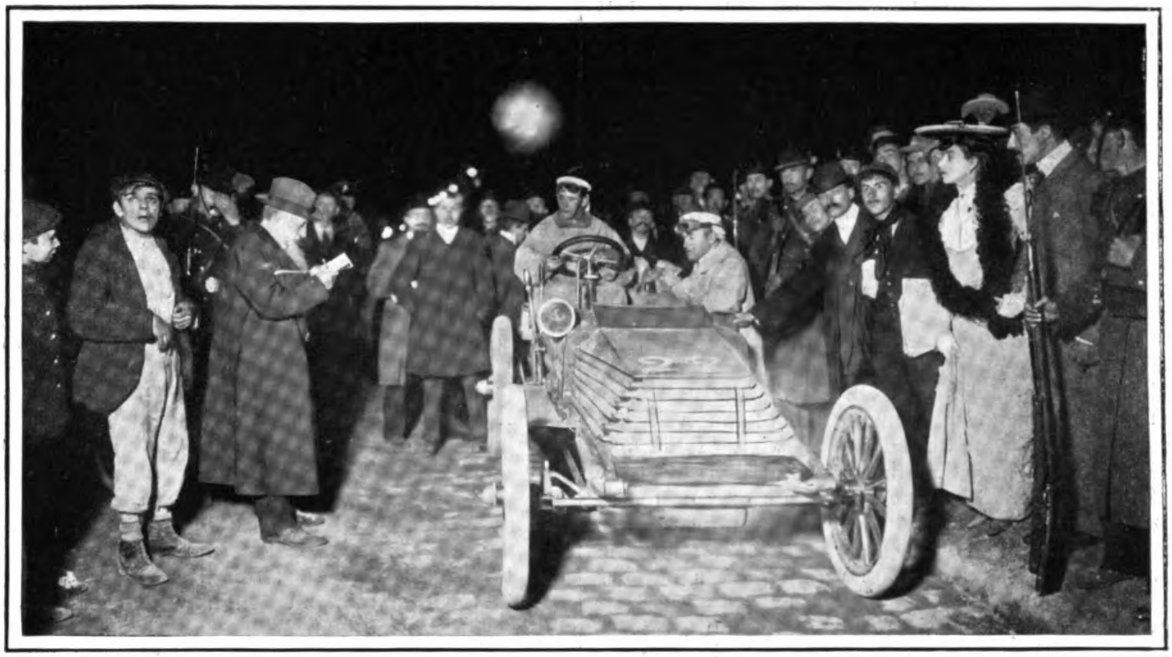
A correspondent who has tabulated some of the results has sent us the following interesting list showing the proportion of cars of the different leading makers which arrived at Bordeaux, together with their average times :—

			h.	m.	s.
Mors	13 started,	6 finished in the average time of	6	50	20
Mercedes ...	12 ,,	9 ,, ,, ,,	7	30	8
Pipe (24-h.p.)...	4 ,,	2 ,, ,, ,,	8	14	6
Panhard ...	16 ,,	9 ,, ,, ,,	8	45	43
De Dietrich ...	10 ,,	6 ,, ,, ,,	8	40	16
C.G.V. ...	4 ,,	3 ,, ,, ,,	9	9	52
Serpollet (steam)	7 ,,	3 ,, ,, ,,	9	48	20

Masson's Clement Car, which made the fastest time (7 hrs. 19 mins. 57⅕ secs.) in the voiturette class, was fitted with Dunlop motor tyres, and in the motor bicycle section no less than five amongst the first half-a-dozen to arrive were fitted with these well-known tyres. The tyres on Mr.



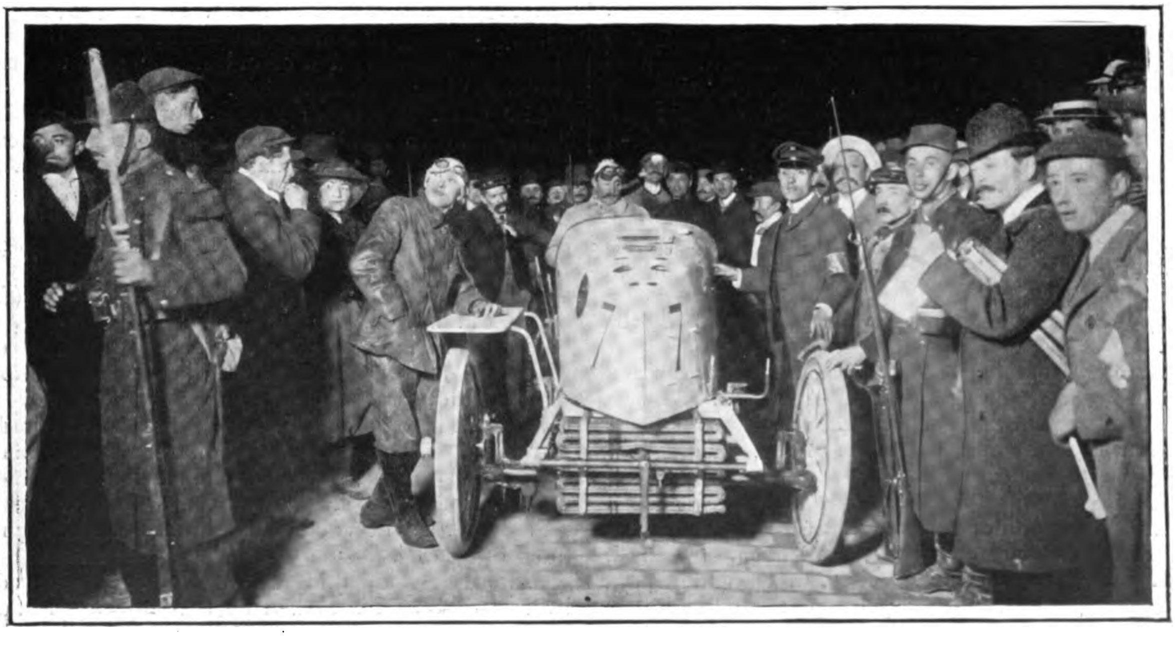
Paris-Madrid.—The stamping operations. In the weighing enclosure. Rigal's Mors car undergoing the necessary ordeal



Paris-Madrid.—At the start. Taken by flashlight. Lieut. Smith-Cumming's 50-h.p. Wolseley Racer waiting its turn to start. Mr. Sydney Girling is at the wheel, the owner standing at the side.

Jarrott's car were Continentals, and we are told that no fewer than 59 competing vehicles were shod with tyres of the same make; the manufacturers of the Continentals offered 36 prizes in all to winners using those of their make, the prizes amounting to nearly £1,800.

The English reserve men for the Gordon Bennett Cup driving in the race were Mr. Mark Mayhew, No. 138 (first reserve), on a Napier; the Hon. C. S. Rolls who was driving a Mors; and Lieut. Mansfield Smith-Cumming in the Wolseley car, with Sydney Girling as driver. The French Gordon Bennett drivers were Ch. de Knyff (Panhard); M. Fournier (Mors); and H. Farman (Panhard). Germany was represented by Baron de Caters, Hieronymus, and Foxhall Keene on Mercedes cars, Werner, the rejected driver, also driving a similar machine.



Paris-Madrid.—At the start from Paris. Taken by flashlight. M. H. Fournier on his 70-h.p. Mors car.

The English drivers who started in addition to Mr. Jarrott and the above were Mr. Leslie Porter, Mr. Harvey Foster, and Mr. H. Austin, all of whom drove Wolseley cars; Mr. Stead and Mr. Loraine Barrow both on De Dietrich cars, Mr. J. H. Holder, of Birmingham, on a Panhard, Mr. J. Mann (Hotchkiss), Mr. H. R. Kirk (Napier), Mr. Heath (Panhard), Mr. E. H. Arnott (Werner motor bicycle) Mr. J. Ball and Mr. J. J. Leonard (Humber motor bicycles), Mr. C. W. Hacking, Mr. Sydney Bowkett, and Mr. A. C. Wright (Ormonde motor bicycles).

The Paris-Madrid race is the first occasion on which competitors were permitted to enter teams of cars. We some time back gave the rules dealing with this form of entry, but it may be as well to recapitulate for the benefit of those who are not acquainted with the arrangement, what the leading features of the system are. Any firm may arrange to enter teams of the same make of four vehicles, whether owned by private owners or otherwise. If all four vehicles arrive at the goal their times are added up together. If any of them drop out they are allowed for only up to the last control where they were ticked off. The principle has been adopted on account of its effect in demonstrating the capabilities of any particular firm of turning cut a number of reliable racing cars.

No one maker was allowed to enter more than one team in each class. Altogether 21 groups of 4 cars each were entered, as follows:—

HEAVY CARS:—1, Charron-Girardot-Voigt; 2, De Dietrich; 3, Mercedes; 4, Pipe; 5, Gardner-Serpollet; 6, Wolseley.

LIGHT CARS:—1, Clement; 2, Darracq; 3, Decauville; 4, De Dion-Bouton; 5, Prosper-Lambert; 6, Renault frères; 7, G. Richard-Brazier.

VOITURETTES:—1, Ader; 2, Corre; 3, De Dion-Bouton; 4, Passy-Thellier; 5, Renault frères; 6, G. Richard-Brazier.

MOTOR BICYCLES:—1, Clement; 2, Peugeot frères.

The list of accidents occasioned by the race has no doubt been a bad one, the tale of killed and wounded amounting in all to seven killed outright and seven seriously injured. The majority were competitors; but a woman, two soldiers, and a boy were amongst the victims. There can be little doubt as to the real cause. In the first place the cars were more highly powered and attained speeds never reached before. Secondly, they were started at shorter intervals than on any previous occasion. The crowds along the route, at any rate at parts, were greater, and the interest in the proceedings more unrestrained. The effect of the increased speed and the shorter intervals between the cars was to make the cloud of dust which enveloped the course more impenetrable and more confusing, and this accounted at any rate for three of the mishaps.

The large number of spectators, their enthusiasm, and the difficulty of controlling them, together with the dust which hid the approaching cars, accounted for the accidents which occurred to the members of the public. The following is a *résumé* of the casualties.

Mr. Leslie Porter's Wolseley car, about 2 kiloms. from Bonneval (105 kiloms. from Paris), was overturned at a level crossing, and catching fire, Mr. Nixon, of Belfast, who was acting as mechanic, was pinned underneath, his body being burnt, although by reports to hand it is gathered that death from the first accident must have been instantaneous.

Near Libourne, Mr. Loraine Barrow having covered 527 kiloms., and when within 25 kiloms. of Bordeaux, ran over a dog with fatal consequences to his mechanician, Mr. Barrow being seriously injured.

At Angoulême, 426 kiloms. out, M. Tourand's car ran amuck in trying to avoid a child, killing a soldier, an onlooker, and his own mechanic; M. Tourand and another spectator being also injured.

Mr. Stead, at Montguyen (490 kiloms. from Paris), 62 kiloms. from Bordeaux, after racing with Salleron on a narrow road, in an attempt to pass collided with him, and was overturned into a cutting. No fatalities ensued, but both Mr. Stead and his chauffeur were badly injured.

Marcel Renault, when trying to pass Théry at a corner near Couhé-Verac, turned off the road and dashed into a tree, M. Renault falling under the car. He smashed his head, sustained frightful internal injuries, and had both legs broken. He subsequently succumbed to his injuries on Wednesday morning last. Miraculously his mechanician escaped almost unhurt. Maurice Farman, who came up almost immediately, stopped to assist his old friend, and, rather than leave him to chance, determined to abandon the race. When the news reached Louis Renault, at Bordeaux, he also at once retired, and withdrew all the other Renault cars entered by his firm.

Georges Richard, driving one of his own cars, on the Chauveau Hill, 5 kiloms. from Angoulême, ran into a donkey cart with unpleasant results to himself, including broken ribs and other injuries.

At Chartres, Fournier, Vanderbilt and Baron de Forest gave up the race owing to damage to their cars.

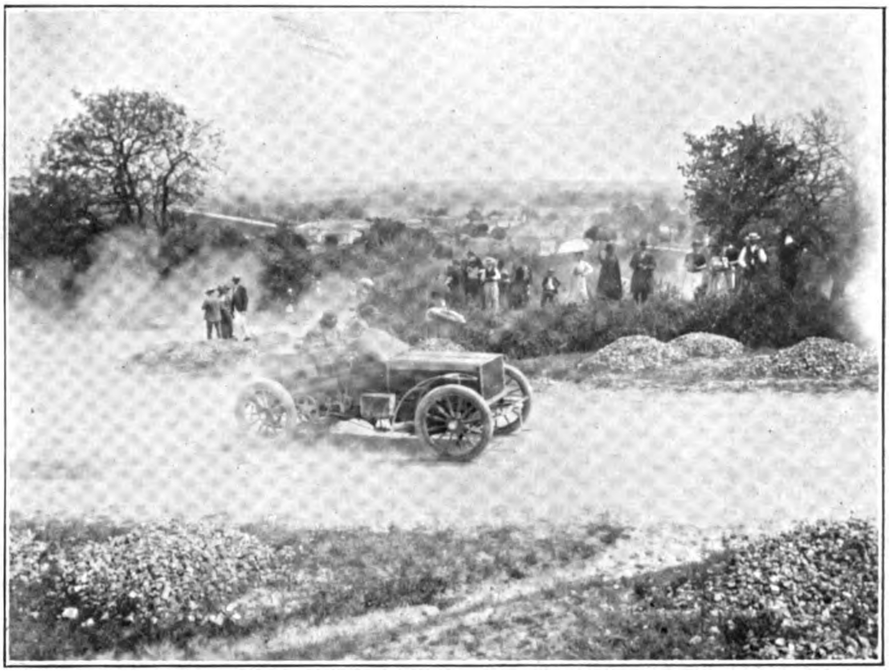
Mr. Mark Mayhew, who drove his Welbeck-Napier, had the worst of luck, as up to La Gironde, 40 kilos. from Bordeaux, he had been travelling well, and then to his horror he realised something had gone wrong with his steering gear, and his car left the road. Mr. Mayhew put on all brake power, but even then the car smashed into a tree with terrific force, but fortunately with no worse injuries than a severe shaking and bruised ribs to Mr. Mayhew. His mechanician, Mr. Mosses, saved himself by jumping. Subsequent examination revealed the fact that there was a flaw of old standing in the metal of one of the steering connections.

Mr. J. H. Holder, of Birmingham, who arrived on his Panhard in 10 hrs. 31 mins. 2 secs. at Bordeaux, had a narrow escape from being dashed into by a train at a level crossing.

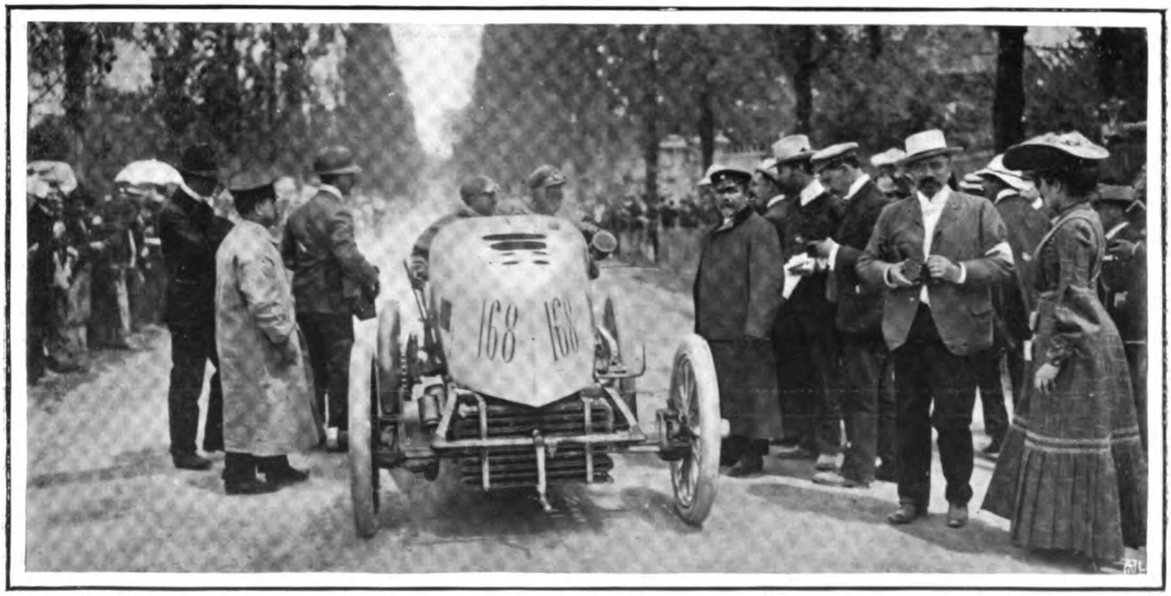
Mr. C. S. Rolls (Panhard) retired through serious injury to his engine. Mr. Rolls finished the journey on a tourist car.

Lieut. Smith-Cumming, whose Wolseley car (the one which did not compete at Welbeck) was driven by Mr. Girling, had a serious accident. Being in danger of colliding with a child in the road, Mr. Girling determined to take a wall instead, with disastrous results, fortunately to the car only. Two other of the Wolseley cars also retired. That driven by Mr. Harvey Foster soon after starting ran over a cyclist, and the misfortune disinclined him to continue the trial. Another Wolseley car driven by Mr. H. Austin also retired near Couhé-Verac with a broken connecting rod due to a hot bearing.

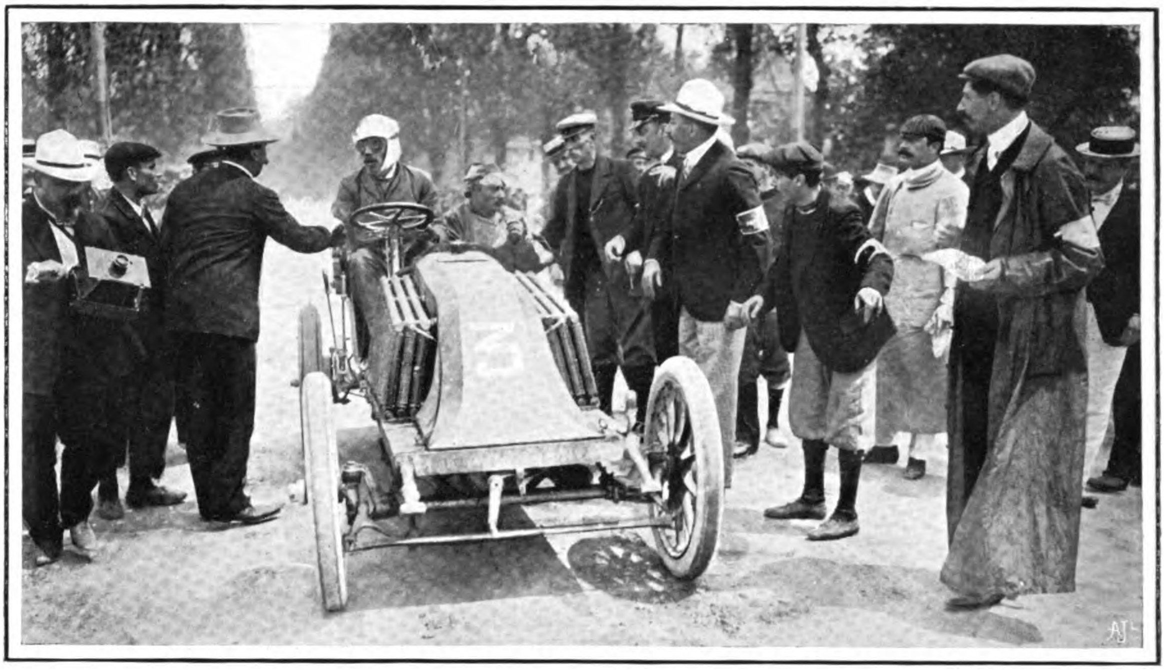
Mr. Terry, on a Mercedes (No. 290), escaped death by a hair's-breadth. When he tried to pass Mr. Porter's Wolseley car on the left, at Coigmeres, the Wolseley car also suddenly took the same direction. Prompt as lightning



Paris-Madrid.—M. Voigt on his 40-h.p. C.G.V. car (No. 153) coming round a sharp corner on the Petignac Hill. Voigt made the 7th best time of 6 hrs. 1 min. 9½ secs. This spot is about 15 kiloms. beyond Angouleme, the scene of most of the worst mishaps. The character of the country through which the racers passed can be judged from this picture.



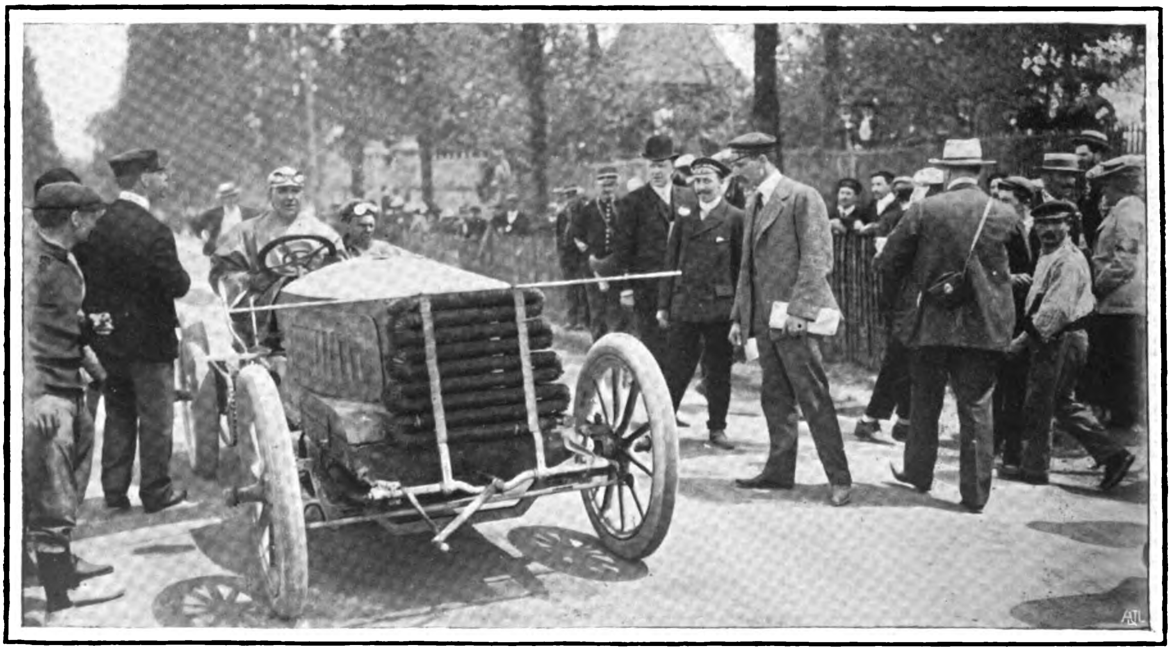
Paris-Madrid.—The finish at Bordeaux. M. Gabriel at the Bordeaux Control on his Mors car, the winner of this stage. His net time was 5 hrs. 13 mins. 31 secs. for the 342½ miles.



Paris-Madrid.—At the Bordeaux Control. M. Louis Renault receiving congratulations upon his car being the first to arrive at Bordeaux, placing him first in his class of light cars. Net time, 5 hrs. 33 mins. 59 secs. In the general classing M. Renault has to give way to Gabriel, who started after him, and whose time on a 70-h.p. Mors was 5 hrs. 13 mins. 31 secs.

Mr. Terry turned into the pavement, burst a tyre, and skidded past Mr. Porter's car sideways. The car caught fire, the petrol tank was fractured, and by the time the car was brought to a standstill it was practically demolished. Both Terry and mechanicien were uninjured.

Almost immediately after the arrival of the cars at Bordeaux, the news was promulgated that the Minister of the Interior had prohibited the further continuance of the race on French soil. This action was afterwards supported by the corresponding Spanish authority, who also prohibited



Paris-Madrid.—Mr. Charles Jarrott just arrived on his De Dietrich car at the Bordeaux Control. Mr. S. F. Edge is seen on the right, taking stock of the car.

the continuance of the race on that side of the Border. An attempt was made to organise a movement for conveying the cars to the Spanish frontier and continuing the race in spite of the Spanish Government opposition in that country, but this project was not warmly supported and came to nothing.

Subsequently, in the French Chamber, M. Combes made some very sensible remarks when alluding to the subject of the accidents. It is to be hoped that his observations will be laid to heart both in this country and abroad by those who are exploiting the accidents to do as much injury as they can to the development of the industry. M. Combes pointed out that the accidents have been somewhat exaggerated, and some of those who were first reported to be dead, and then not expected to recover, were doing fairly well. He also cautioned the Chamber against exaggerated feeling which might lead, by the adoption of too severe measures, to the ruin of a prosperous industry. This is precisely the object which a number of people in this country appear to have in view, but we believe we can trust the Government not to be intimidated by the outcry. The Marquis De Dion also very properly remarked that it was the hundreds of workmen rather than the rich few who would be injured by the Chamber, in a fit of hysterics, introducing repressive legislation.

THE general classing by time of the first twelve cars for the first stage to Bordeaux is as follows :—

		h.	m.	s.			h.	m.	s.
1	Gabriel (Mors) ...	5	13	31	7	Voigt (C.G.V.) ...	6	1	9⅕
2	Louis Renault (Renault frères)	5	33	59	8	Gasteaux (Mercedes)	6	8	0
3	Salleron (Mors) ...	5	46	1	9	A. Fournier (Mors)	6	11	39
4	Jarrott (DeDietrich)	5	51	55	10	Baras (Darracq) ...	6	12	49
5	Warden (Mercedes)	5	56	30⅘	11	Rougier (Turcat-Mery)	6	16	7⅘
6	De Crawhez (Panhard)	6	1	8⅗	12	Mouter (DeDietrich)	6	17	54⅕

The classing by categories is as follows :—

HEAVY CARS.

		h.	m.	s.			h.	m.	s.
1	Gabriel (Mors) ...	5	13	31	26	Langlois (Panhard)	8	5	47⅘
2	Salleron (Mors) ...	5	46	1⅘	27	Van de Poële (Pipe)	8	24	6⅗
3	Jarrott (DeDietrich)	5	51	55	28	Barbaroux (Benz)...	8	35	14
4	Warden (Mercedes)	5	56	30⅘	29	Gavaris (Panhard)	9	5	32⅘
5	De Crawhez (Panhard)	6	1	8⅗	30	Charron (C.G.V.)	9	15	32
6	Voigt (C.G.V.) ...	6	1	9⅕	31	D'Udekem (Serpollet)	9	20	46⅗
7	Gasteaux (Mercedes)	6	8	0	32	Hieronymus (Mercedes)	9	30	45
8	A. Fournier (Mors)	6	11	39	33	Duray (Gobron-Brillié)	9	40	1
9	Rougier (Turcat-Mery)	6	16	7⅘	34	Durand (Mors) ...	9	49	42⅗
10	Mouter (De Dietrich)	6	17	54⅕	35	Van der Eyden (Panhard)	9	50	12⅕
11	Jenatzy (Mercedes)	6	24	8⅖	36	Degrais (Mercedes)	10	2	45⅖
12	Max (Mercedes) ...	6	39	35⅘	37	Lafont (De Dietrich)	10	11	26⅗
13	Le Blon (Serpollet)	6	43	51⅘	38	Ollivier (Serpollet)	10	15	6⅗
14	Berteaux (Panhard)	6	46	55	39	Caillois (Serpollet)	10	25	24
15	Augières (Mors) ...	6	52	49⅘	40	Holder (Holder) ...	10	31	2⅘
16	Chanliaud (Serpollet)	7	7	1	41	Kœchlin (Gobron-Brillié)	10	35	28⅗
17	Braun (Mercedes)	7	7	41	42	Mme. du Gast (De Dietrich)	10	52	47⅖
18	Teste (Panhard) ...	7	14	23	43	Turr (Panhard) ...	10	56	12⅗
19	Lavergne (Mors)...	7	21	49	44	Beutler (De Dietrich)	11	20	45
20	Rigolly (Gobron-Brillié)	7	43	8⅘	45	Comiot (C.G.V.)...	11	30	0
21	De Caters (Mercedes)	7	48	2	46	Stéphen Ribes (Panhard)	12	52	18⅗
22	Kohler (Mercedes)	7	53	50	47	Gasté (Automotrice)	13	21	10
23	Lamberjack (Panhard)	7	59	0	48	Amblard (Mors) ...	13	39	20
24	Guders (Pipe) ...	8	2	26⅗	49	Lillie (Serpollet) ...	14	58	2
25	De Brou (De Dietrich)	8	2	50⅗					

LIGHT CARS.

		h.	m.	s.			h.	m.	s.
1	L. Renault (Renault frères)	5	33	59	16	Loste (C.G.V.) ...	9	13	15
2	Baras (Darracq) ...	6	12	49⅕	17	Vessin (Auto-Motobloc)	9	38	47
3	Page (Decauville)	6	1	98⅕	18	D'Hespel (d'Hespel)	9	59	25
4	Hemery (Darracq...	6	52	33⅘	19	Storero (Fiat) ...	10	45	8
5	Pellisson (De Dion-Bouton)	7	12	43⅘	20	Dombret (Auto-Motobloc)	11	5	22
6	Théry (Decauville)	7	13	16	21	Dernier (Clement)	11	21	23⅘
7	Edmond (Darracq)	8	0	34⅕	22	Davaud (P. Lambert)	12	24	40
8	Sincholle (Darracq)	8	4	7⅗	23	Deniot (Henriod)...	12	27	58⅗
9	Osmont (Darracq)	8	29	40⅗	24	Persan (Corre) ...	12	31	22
10	Bardin (De Dion-Bouton)	8	30	13⅗	25	Quinzeaut (Ader)...	12	34	19⅕
11	Giraud (C.G.V.) ...	8	37	45⅕	26	Pagliano (P. Lambert)	13	26	40
12	Rasson (Clement)...	8	46	52⅗	27	Dombret (Auto-Motobloc)	14	8	42
13	Simon (Ader) ...	8	54	0⅕					
14	Valentin (Ader) ...	8	58	43⅘					
15	Chenu (Chenu) ...	9	6	49⅘					

VOITURETTES.

		h.	m.	s.			h.	m.	s.
1	Masson (Clément)	7	19	57⅕	11	Weisser (De Dion Bouton)	8	46	26⅗
2	Barillier (G. Richard)	7	39	0⅗	12	Sommier (Ader) ...	8	59	30⅗
3	Wagner (Darracq)	7	47	12⅕	13	Corre (Corre) ...	9	27	36⅗
4	Comber (G. Richard)	8	7	26⅕	14	D'Houdeauville (Passy-Thellier)	9	28	31⅕
5	Holley (De Dion Bouton)	8	22	19	15	Gautier (Ader) ...	10	25	26⅘
6	Legras (Passy-Thellier)	8	24	56⅘	16	Maillard (G. Richard)	10	56	43⅘
7	Maurice Fournier (Clement)	8	25	32	17	Aaron (Corre) ...	11	22	22⅕
8	Birnbaum (Ader)...	8	25	50⅗	18	Leberte (De Dion Bouton)	11	50	59
9	Vilain (Prenel) ...	8	40	14⅕	19	Flouret (Flouret)...	11	55	50
10	Villemain (Darracq)	8	42	7⅘	20	De Boisse (De Boisse)	11	59	51
					21	D'Aubignon (Ader)	13	4	26

MOTOR BICYCLES.

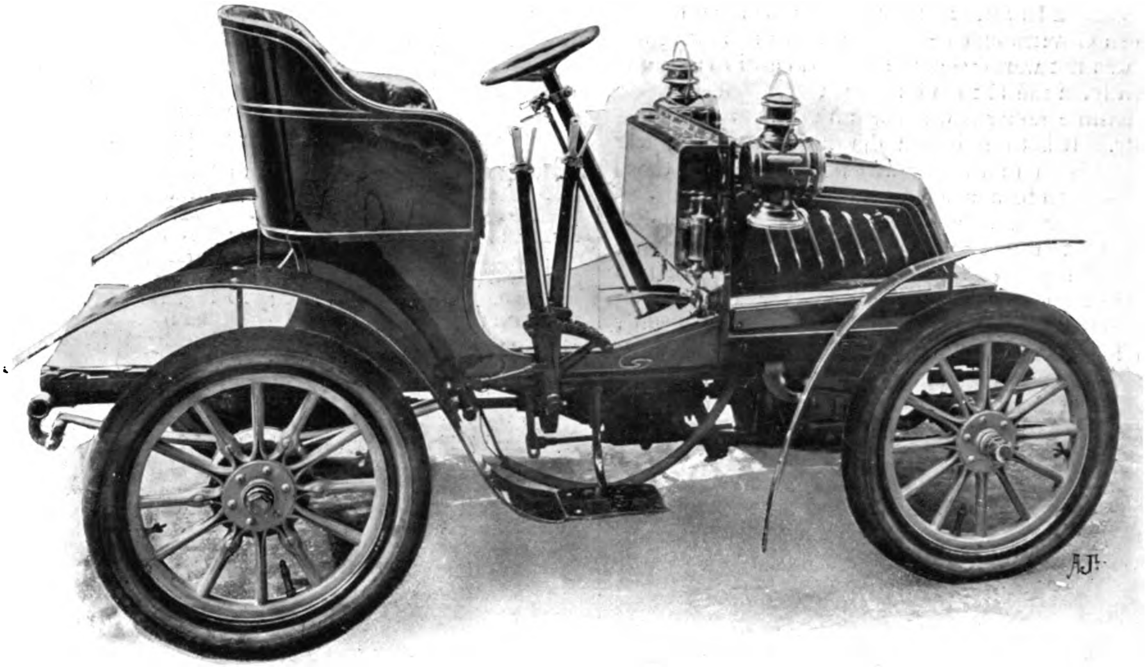
		h.	m.	s.			h.	m.	s.
1	Bucquet (Werner)	8	57	1	7	Griet (Griffon) ...	10	43	46⅕
2	Demester (Griffon)	9	3	44	8	Momo (Peugeot) ...	11	3	20
3	Jollivet (Griffon)...	9	25	54⅗	9	Prost (Doué) ..	11	42	5
4	Cissac (Peugeot) ...	9	39	36⅘	10	Arnolt (Werner) ...	12	8	2
5	Lanfranchi (Peugeot)	9	50	40	11	Martel (Griffon) ...	13	11	2
6	Derny (Clément)...	10	23	23	12	Baret, Mot. Bruneau	13	59	0
					13	Maillard (Werner)	14	3	18

* * *

FOR some time past there has been a tendency displayed, particularly in the Liberal and Radical Press, to represent the motor car as the plaything of the wealthy, and the future of the motor car industry to be a matter in which only the well-to-do are concerned. The accidents that occurred in the Paris-Madrid race have been exploited for the purpose of adding virulence to this point of view, and we encounter exaggerated descriptions of what took place under such headings as "The Diversions of Dives." We would like to point out, however, to these journalists in hysterics that for every wealthy man who purchases and drives a motor car hundreds of clerks, mechanics, fitters, and various employees are provided, at any rate with the means of subsistence, by the new industry. When a certain class of journalists let themselves go it is generally their sense of perspective which is first impaired.

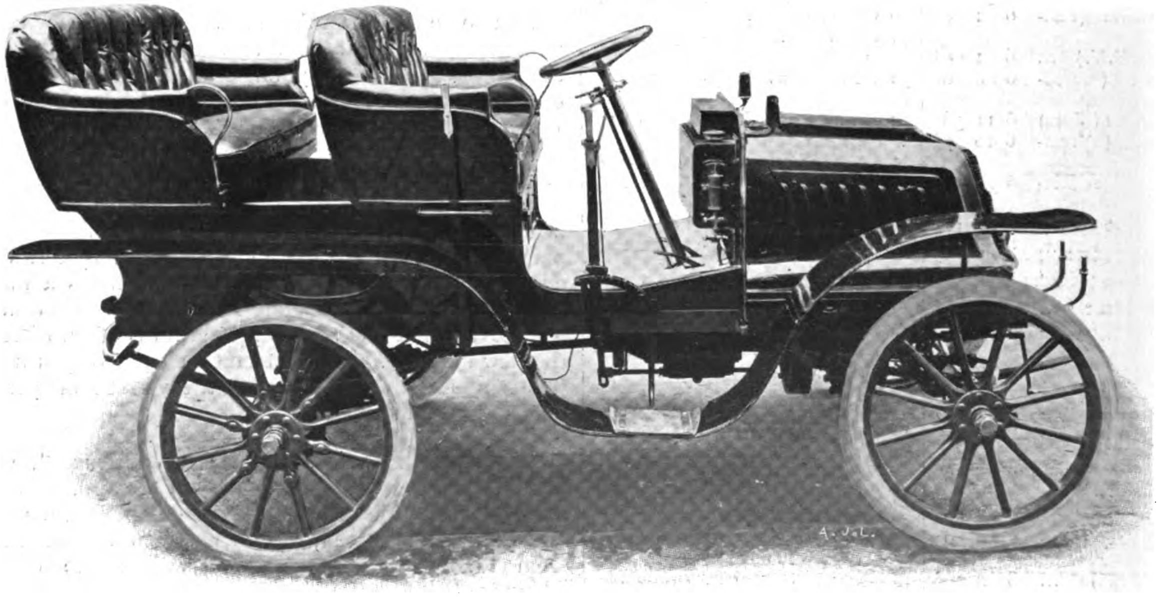
A NAVIGABLE aerostat is being constructed, with the financial assistance of Mr. Gordon-Bennett, by a Belgian aeronaut named Capazza. When completed, next spring, an attempt, it is stated, will be made to cross the Atlantic from Lisbon to Beunos Ayres, when the constructor proposes to take with him the famous French geographer, M. Elisée Reclus, and several other passengers.

THE "CONTINENTAL" PETROL CARS.

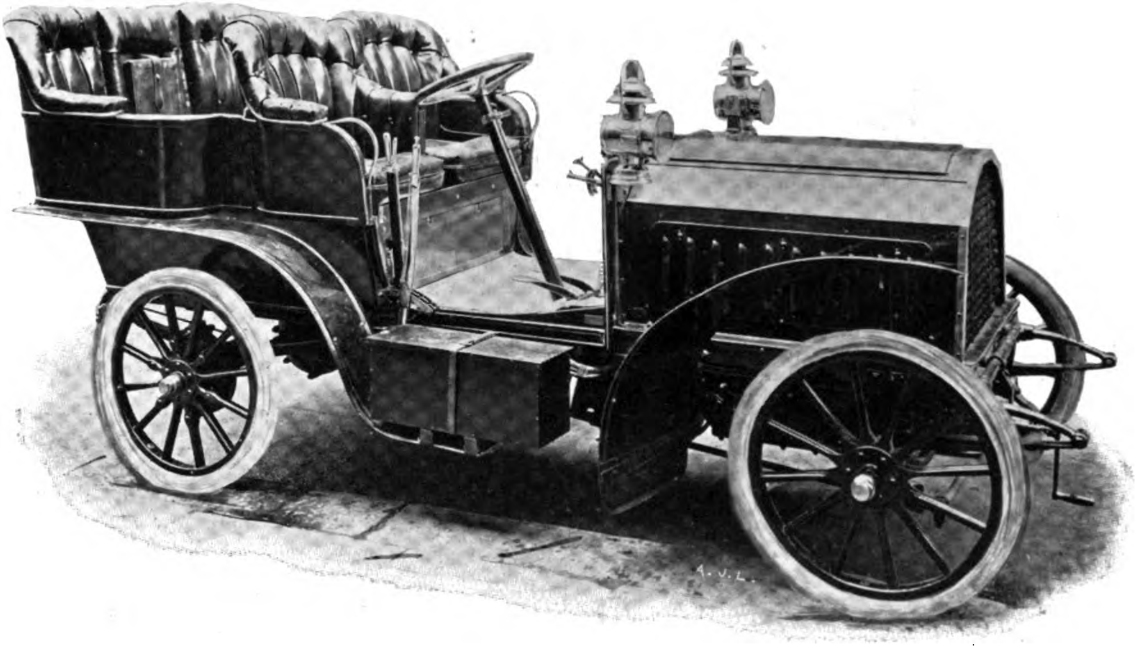


6-h.p. Single-cylinder "Continental" Car, with spider seat.

THESE vehicles, which were first brought before the notice of the public at the Automobile Exhibition at the Crystal Palace, and are built in Paris, have been specially designed with a view to meeting the demands of those requiring an automobile at a moderate price, and who expect to receive full value for their money. They are made in several standard sizes, having either single-cylinder, twin, or four-cylinder engines, ranging in power from 6-h.p. up to 24-h.p. The engines are in all cases fitted with centrifugal governors, which regulate the speed by acting upon a throttle valve. The general construction adopted throughout includes the use of a tubular main frame and underframe, the engine and the gear-box being fixed to the latter. The form of transmission employed is of the well-known longitudinal



12-h.p. Twin-cylinder "Continental" Tonneau.

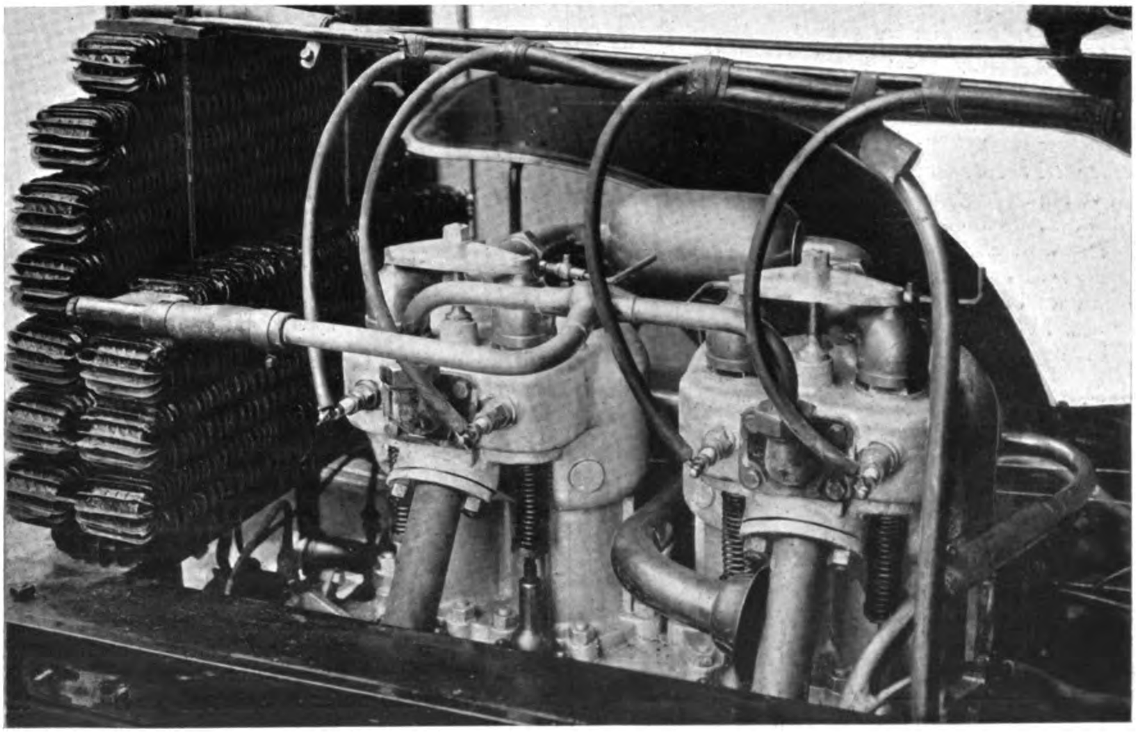


24-h.p. Four-cylinder "Continental" Tonneau.

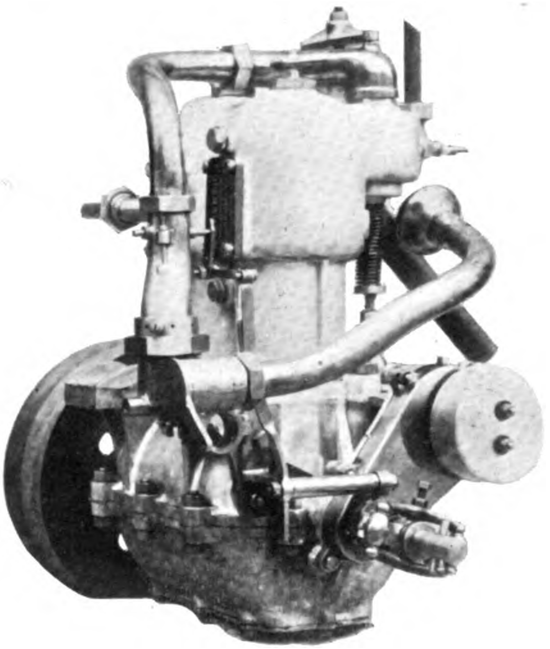
shaft and live-axle type, and the main clutch, which is as usual formed in the flywheel, is of the internal cone pattern.

The standard chassis models consist of a 9-h.p. vehicle having a single-cylinder motor, of one with a 12-h.p. twin-cylinder engine, and of a 24-h.p. machine with a 4-cylinder engine. There is also a smaller single-cylinder vehicle of 6-h.p., and a 14-h.p. car, which only differs from the 12-h.p. in having slightly larger cylinders.

The engines themselves are of the well-known Henriod make. They are all fitted with atmospheric inlet valves, and with enclosed valve gearing. Those having one cylinder are provided with Henriod carburettors, in which it will be remembered that the air opens the petrol valve as it passes through it, and no float-feed device is employed, the apparatus being, perhaps, more aptly termed a mixing valve. With the multi-cylinder engines the Espinasse car-



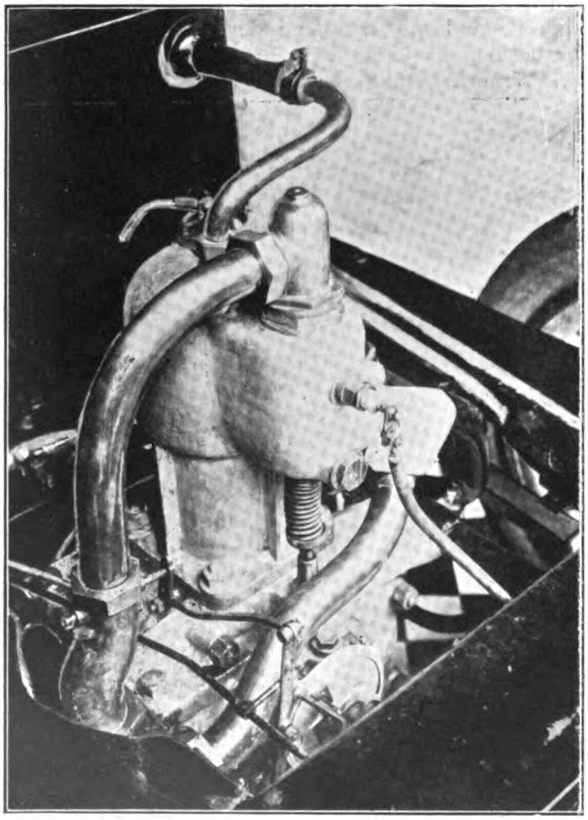
A 24-h.p. Engine in place in a Car.



12-h.p. "Henriod" Engine.

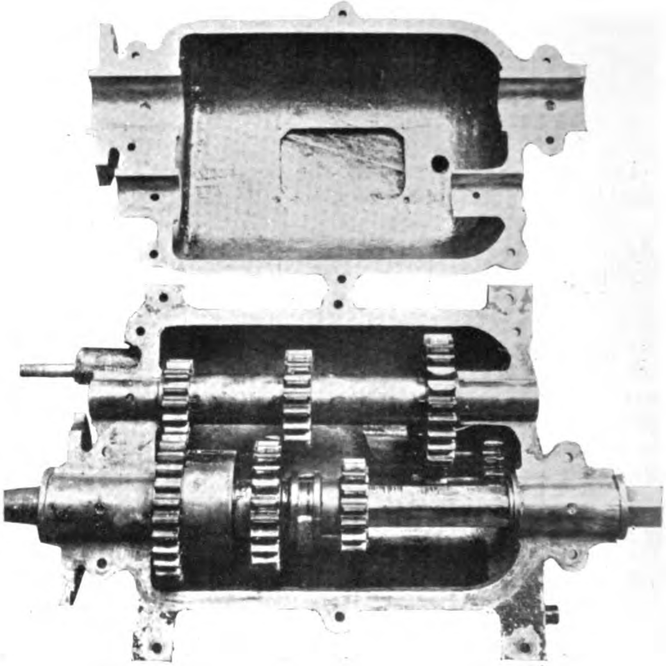
burettor, which we describe and illustrate in our article dealing with the Crouan cars, is now being employed, although hitherto the Longuemare model has been used. The general appearance of each type of motor will be gathered from our illustrations, and it will be seen that an ignition system of the ordinary high tension type has been adopted. The engines are all water-cooled, and the circulation is maintained by a centrifugal pump driven by a friction wheel running against the rim of the flywheel. The radiators form the front of the bonnets, and water-tanks are either fixed in front of the dash or carried beneath the seat. In the small cars the petrol tank is fixed behind the dashboard, and in the larger sizes it lies beneath the driver's seat.

The cylinder of the 6-h.p. engine has a bore of 100 mm., and the stroke is 120 mm., the normal speed being 1,200 revs. per minute. The 9-h.p. cylinder has a bore of 110 mm. with a stroke of 130 mm., and the speed is the same as with the 6-h.p. The 12 and 24-h.p. engines have cylinders 100 mm. in diameter, with a stroke of 130 mm., the normal speed of these motors being 1,000 revs. per minute.

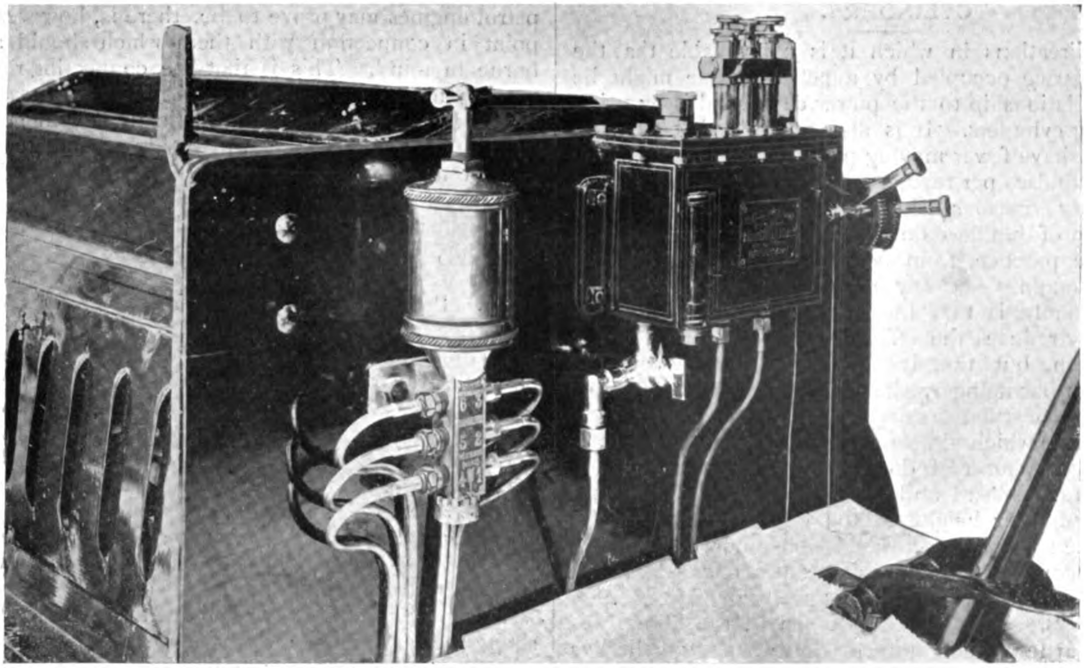


A Single-cylinder Engine fixed in position.

The change-speed-gear is of that type in which a through-drive is obtained on the top speed. Except in the 24-h.p. cars, in which four forward speeds are available, three forward speeds and one reverse are provided. The construction of the gear-box is seen in one of our illustrations, where it will be noticed that the lay-shaft through which the two lower speeds and the reverse are obtained, lies alongside the through-shaft, and that it, at all times, revolves when the car is travelling. The top speed is obtained by means of a jaw-clutch, as in other gears of this kind; the sliding jaws, however, in this design have to be forced into engagement with the other member of the clutch against the action of a spring which normally tends to throw them out. The intermediate spur-wheels, which give the "reverse," are seen in place at the bottom of the gear-box. The various speeds are introduced by sliding the sleeve carrying the two gear wheels and the clutch-jaws on the engine-driven shaft, and this sleeve is connected with the hand-lever which, as usual, works in a slotted quadrant at the side of the car.



View of the change-speed gear-box with cover removed. Three speeds and a "reverse."



View of dash on larger cars showing 6-feed grease-lubricator and sight-feed water-pressure lubricator for engine.

The live-rear-axle is of similar construction to that on other cars of similar design. The differential gear and the bevel wheels driving it are enclosed in a central casing, and the axle itself passes through the stationary tubes by which it is connected to the main frame through the side springs. It is provided with ball-bearings, as also are the front wheels. The wheels themselves are of the artillery type, and are intended to be fitted with pneumatic tyres, although these are not included in the prices quoted in the Company's catalogue.

The lubrication of the various parts is well provided for both on the larger and the small cars. On the latter, a hand-pump, in conjunction with a three-way cock, enables the driver to force oil from the container on the dashboard either to the engine or to the gearing. The large cars are fitted with an automatic lubricator, in which the water pressure in the circulation system feeds the oil through the various pipes; it is mounted on the dashboard. The transmission gear is supplied with grease from the special six-feed greaser, which is seen on the dash in one of the accompanying photographic reproductions. We have previously described this form of lubricator, but have not hitherto had an opportunity of illustrating it. It will be noticed that three pipes lead out from each side of the pump cylinder, and that there is, at the base of the cylinder, a separate piece of metal which has numbers ranging from 1 to 6 marked upon it. The cylinder itself is filled with grease, and its plunger can be forced down by screwing the handle round in one direction. If, however, the handle is turned left-handedly it does not again raise the plunger, but it instead causes the numbered indicator to turn round, and at the same time it puts the cylinder in communication with the particular delivery pipe, which corresponds with the number shown. This device, therefore, enables the driver to force grease into whichever part of the mechanism he wishes.

The usual regulating levers and pedals are provided, the main clutch being operated by one pedal, and the band-brake, which is fitted immediately behind the gear-box, by another; the brakes on the hubs of the rear wheels are actuated by a side lever. The brake-pedal also disengages the main clutch, and the brake-lever can either be made to do so or not according to the fancy of the purchaser.

These vehicles are of strong construction and the carriage work is tastefully finished. They are, as we have already said, built for those who require a reliable machine at a comparatively low price. In order to render them even more popular, the Continental Automobile Company have made arrangements by which they can be obtained from them, at 20, Long Acre, on a deferred system of payment if desired.

Started in quite a small way, the Bristol Motor Company, of 5, Redcross Street, Bristol, have developed an important central agency for motor cars. They advise us that they are now the sole agents for Gloucestershire and Somerset of the Clement cars, and the sole district agents for Daimler, Argyll, Locomobile, Brush, and Peugeot cars, and act as sole wholesale and retail agents for Clincher-Michelin tyres. The growth of the business has necessitated the Company's removal recently to new and more extensive show rooms in the centre of the city, 18, Victoria Street, where they are stocking a considerable variety of the cars which they represent. A good assortment of accessories and spare parts is stored, and in addition a motor clothing depôt is being opened. The works and day-and-night garage in Redcross Street have been enlarged and remodelled, some specially suitable machinery having been added to meet the requirements of the touring automobilist. With five years' experience their assistance should prove of value to automobilists passing through this ancient western city.

A PETROL ENGINE WITH DOUBLE-ACTING CYLINDERS.

ONE of the directions in which it is conceivable that the weight and space occupied by a petrol engine might be reduced in relationship to the power developed is by using double-acting cylinders. It is also possible that such an engine might have fewer moving parts in relationship to the number of impulses per revolution transmitted to the crankshaft. Many reasons, however, have prevented the ordinary form of double-acting cylinder, commonly used in steam engine practice, from being employed for internal combustion engines—at any rate for the smaller sizes. The chief difficulty is that the piston rod in this arrangement not only reduces the effective area of the under side of the piston, but that it is difficult to prevent the rod itself from becoming overheated; it is, moreover, almost impossible to construct a suitable stuffing-box (for the rod to work through) which will stand the prevailing temperature. With the ordinary form of double-acting steam engines the presence of a cross-head and its guide bars adds considerably to the length or height of the engine, and this alone tends to make it somewhat unwieldy for motor car work.

A very ingenious engine has recently been designed, constructed and experimentally tested by Mr. W. B. Burchall, of Bredbury, Stockport. In it, the above disadvantages of the ordinary type of double-acting cylinders have, to a very great extent at any rate, been overcome. The engine works on the "Otto" cycle, and although the experimental one may be said to have a single cylinder (and is *not* a two-cycle engine as might perhaps be supposed by the uninitiated) yet two impulses are obtained during each two revolutions. In a two-cycle engine, of course, an impulse would be obtained during every forward stroke of the piston at each revolution, but in this case two impulses —one outward and one inward—are obtained at each alternate revolution. The experimental engine has a bore of 4¼ in., and a stroke of 4½ in., the normal speed being 800 revs. per minute.

The motor which Mr. Burchall intends to put on the market will have two horizontal cylinders lying side by side, and will give an impulse during each half revolution of the crankshaft. With the same sized cylinders as that of the present machine, he expects to obtain 20-b.h.p. at normal speed. By his arrangement he is able to dispense with piston-rods and stuffing-boxes altogether. The two ends of the cylinders are identical as to area, and the combustion chambers are of the same shape as one another. In the two-cylinder engine there are to be two connecting rods only, and these are of considerable length in relationship to the stroke; the power is transmitted directly by them to the crankshaft. The two crank-pins are in line with one another, and they are counterbalanced in the flywheel.

We are unable as yet to give full particulars of the actual construction adopted, for Mr. Burchall is at the present time protecting his invention. We can, however, state that in our opinion the engine will prove of considerable interest, and that, although the advantages we have pointed out are obtained, yet there is—apart from those mechanical features which are necessary in order to obtain the desired result—no such radical departure from ordinary modern practice as would be liable to render uncertain its general operation. As soon as the necessary patents have been secured we hope to give a fully illustrated description of this interesting engine, when our readers will find that it is a development which is well worth their attention.

Interesting and useful as double-acting cylinders for petrol engines may prove to be, there is, however, just one point in connection with them which should always be borne in mind. This is that the connecting-rod is alternately put into compression and tension instead of being always in compression, as it practically is with single-acting cylinders. For this reason, many high-speed steam engines —such as those which have been used for driving air compressors and dynamos—have been of the single-acting type, instead of the double, in order to make them run more smoothly, for the connecting-rod bearings are much more apt to develop a "knock" in the one case than in the other. Petrol engines for automobiles essentially run at a high speed, and if constructed with double-acting cylinders, the connecting-rods and their bearings should be of particularly careful design; ample bearing surface should be provided, and provision made by which any wear can be easily taken up. We think, however, that in the Burchall engine, considering the reduction in the number of moving parts, that any drawback in this respect will probably be found to be more than compensated for by the advantages obtained. The engine need be but little longer than those now in use, and would apparently be lighter, besides occupying less space.

In concluding this brief reference to the Burchall engine it should be said that the valves and valve gear, the igniters and the ignition system, are practically identical with those on existing engines, and that although the engine is intended to be of the horizontal type, and will probably be found more satisfactory as such, yet there is no inherent reason why it should not work vertically. The success of any such engine depends largely, of course, upon constructional details, and it is almost impossible to give any definite forecast concerning its commercial value; practical experience can alone determine this. We shall, however, watch this engine with considerable interest, for we believe that the inventor has a good chance of success with it.

THE Association of Chief Constables have appointed a Committee to frame a scheme for submission to the Home Secretary for the purpose of making suggestions as to the best method of identifying motor cars. They are in favour of having numbers and the names of the district in which the owner resides so painted that both may be illuminated at night.

WE alluded some time back to the new terror which has been added to motoring, when a misguided individual selected a motor car as a suitable engine to commit suicide under. Mr. Gilbert had just been sitting on the magisterial bench, and had signalised himself by giving a very common-sense decision in a motor car case. He refused to accept the evidence of a policeman who maintained he had measured the speed of a car by placing pieces of paper on the high road. Mr. Gilbert left the Session in his motor car, when a defendant, who had been dissatisfied with a decision Mr. Gilbert had given in a case in which he had been concerned, threw himself in front of Mr. Gilbert's car, with the obvious intention of committing suicide. Mr. Gilbert, luckily, was able to pull up within a foot of the prostrate lunatic, who then made off to a butcher's shop and attempted to stab himself with the butcher's knife. We do not know whether the would-be suicide was most upset by the decision against himself or by the acquittal of the motorist. Considering the fanatical spirit displayed by a good many motor-phobists, the question may be regarded as doubtful.

THE NAPIER STEERING GEAR.

AN interesting feature of the Napier cars, and one of that nature which has done so much to give them a reputation for reliability and durability, is shown in the accompanying illustrations. Although this is the first time that these details have been published in any periodical, the steering gear has been adopted on these well-known cars for some little time.

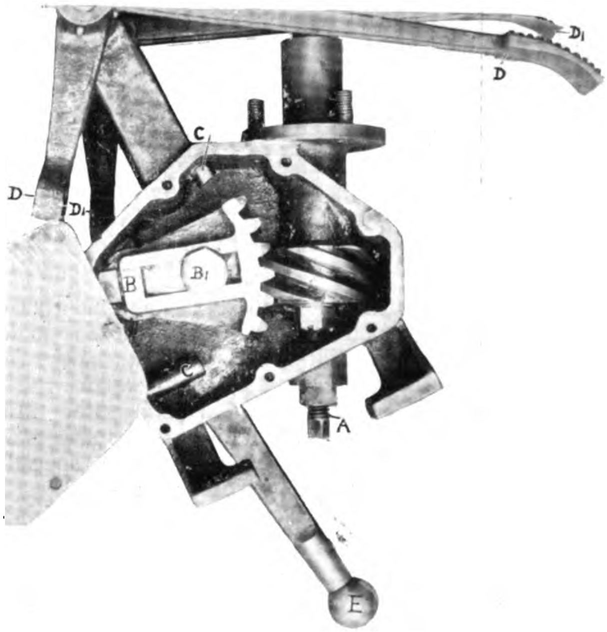


FIG. 1.—The Napier Steering Gear. View of Casing containing Worm-Wheel and Toothed Segment.

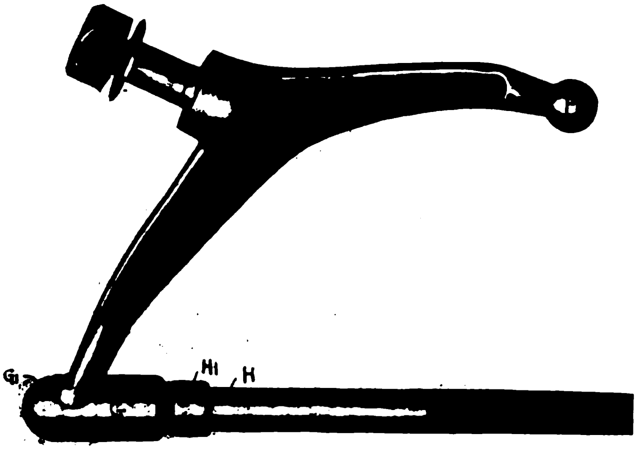


FIG. 2.—Lever Arm for off-side Steering Head, and part of Transverse Connecting Rod.

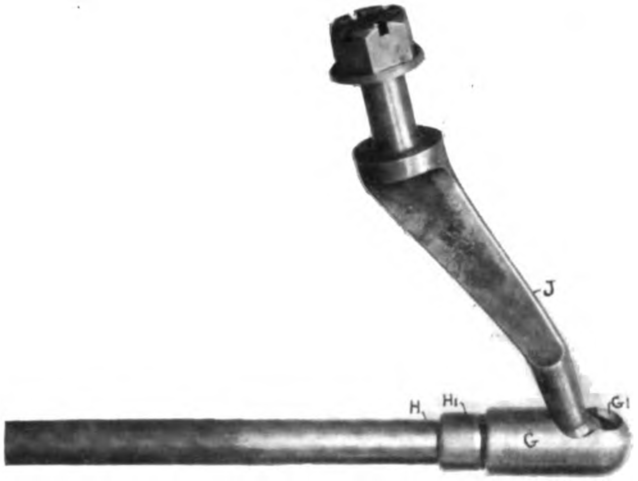


FIG. 3.—View of Lever Arm on near-side Steering Head, with part of Connecting Rod.

The design is chiefly interesting because it provides means by which all wear, with the resulting back-lash, can be taken up; strength and simplicity are also secured. Fig. 1 shows the casting at the base of the steering pillar. The light cover has been partially removed so as to expose to view the worm and the corresponding toothed quadrant. The same casting also provides a bracket to which the pedals, D and D^1, operating the main clutch and the foot brake, are fulcrumed. Any wear which would allow the worm-wheel and its shaft to move longitudinally can be compensated for by means of the adjustable set screw, A, which is fitted beneath it; the screw is provided with a lock nut for preventing it from shaking loose. The quadrant, B, is so made that it can be brought into true mesh with the worm-wheel by feeding it forward or backwards after slackening the locking stud, B^1. For this purpose it has a machined slot which fits over a machined block which is rigid with the pin carrying the lever arm, E. The casing enclosing the gear has hardened stops, C, fitted inside it, in such a manner that the quadrant, B, comes in contact with one or other of them as soon as the full permissible lock of the steering wheels is reached.

Figs. 2 and 3 show the lever arms, F and J, which are secured to the steering-heads on the off and near sides, respectively. The form of ball-joint which is adopted for connecting the rods with the levers is clearly seen. The sockets, G, are machined out of the solid, and have slots, G^1, cut in them. These slots practically consist of two overlapping holes of different diameters, the larger hole being of sufficient size to allow the ball end of the lever-arm to pass through it, and the smaller being of the correct size for fitting round the neck above the ball end. The connecting-rod, H, screws into the socket, G, and its end comes into contact with the ball, holding it in the smaller portion of the slot, G^1, and forming a means for adjusting the joint. The rod, H, is prevented from unscrewing by means of the lock nut, H^1, although it will be seen that even without it no one of the joints could work loose unless the corresponding one at the other end of that same rod were to become correspondingly tight. This simple steering mechanism will be readily understood by our readers, and we need only add that the materials employed and the character of the workmanship are all that can be desired.

THE GORDON-BENNETT RACE.

Mr. Robert E. Phillips, who, as we announced a fortnight ago, has undertaken to see after the entire timekeeping arrangements for the race and other events of the Irish Fortnight, is anxious to have the names of a number of volunteers to assist him in the various controls. Although naturally preference will be given to those who have some knowledge of timing, Mr. Phillips is particularly anxious that it should be understood that it is not necessary that volunteers have efficient chronographs, as the whole of the chronographs for timing the cars through the controls will be found by the Club. Those who can assist in this important work should address Mr. Phillips at 70, Chancery Lane.

Although not officially decided upon, several suggestions are put forward in regard to events for the Gymkhana at Phœnix Park on July 3rd. A motor-bicycle team race is proposed for a distance of 2 miles, entries being limited to 16 pairs; a scratch race limited to machines under 170 lbs. over a distance of about a mile and a quarter, and, finally, what should prove to be a very amusing item—a slow race over a distance of 440 yards. In this competitors must start unassisted, must not stop the engine, and will only be allowed to pedal up to a certain line. The weights governing the classes for the speed trials in Phœnix Park on the next day will be light machines up to 70 lbs.; medium, 114 lbs.; heavy, 170 lbs. These three classes will take effect for the 4-mile time test and hill-climbing competition at Newcastle on July 7th. Entries for all events must be received at least 14 days prior to the day of the race.

More cups are being added to the list of prizes. The *Graphic* has presented a challenge trophy of the value of 150 guineas for four-seated tourist cars between the value of £300 and £1,000, the course to be over 5 miles in future years, but for this year over the 4-mile Time Test course at Castlewellan on July 7th. The winner for three consecutive years will entitle him to claim the trophy as his property. In addition, the winner each year will receive a medal in the form of a model of the trophy. Mr. Norman D. Macdonald, Chairman of the Scottish Automobile Club, has presented a prize of the value of £10 and the Editor of the *Yachtsman* a 15-guinea cup for motor boat races on the same day as the Harmsworth Cup Race at Queenstown.

Garage accommodation is being provided in several unexpected quarters. Amongst the latest is at the Dublin Custom House Docks, where the entrance can be gained by Store Street, within half a mile of Sackville Street. This is worth noting for those who may be stranded, as the accommodation is stated to be practically unlimited.

A timely protest is being made by the best of the hotel keepers in the south of Ireland against the reports that their charges will be excessive during the Irish Fortnight.

The grand stand being erected by the Automobile Club will accommodate about 1,000 people, and the admission charge will be one guinea in addition to the guinea charged for the use of the Club enclosure, which will include luncheon and tea. Garage accommodation will be provided within a few hundred yards of the Club enclosure, and a store of petrol will also be kept for the use of members and their friends.

It has been decided that within controls competitors may fill the fuel and lubricating tanks from cans taken on board *outside* the control, and, in running, lubricating tanks may also be filled from a supplementary pressure tank attached to the car.

Very extensive arrangements are being made by the L. and N.W. Railway Company for carrying motor cars from Holyhead to Dublin by special steamers, commencing about a week before the race. Special trays are being constructed to facilitate the rapid handling of the cars.

All automobilists do not particularly care for taking part in large organised tours, and there is no doubt that amongst those who will be in Ireland during the fortnight, there will be several who will prefer to explore the exquisite country at their own sweet will and pleasure. Mindful of this, the Lord-Lieutenant of Ireland has suggested—the result of his personal experience—some specially beautiful and interesting tours. These are:—

(1.) From Belfast to Ballycastle along the Antrim coast.
(2.) From Sheephaven to Killybegs, Donegal.
(3.) From Killyleagh to Galway through Connemara.
(4.) From Valentia Island to Parknasilla through Kerry.

An official illustrated guide, with maps, will be issued by Messrs. Helys, Limited, Printers, of Dublin.

Mr. Alexander Winton's Gordon-Bennett racer, which he calls the "New Bullet," has now been completed, and has been given a preliminary test in America prior to being shipped to Ireland from New York. In general appearance the new machine resembles Mr. Percy Owen's racer; it, however, weighs considerably more and has eight cylinders instead of four. The main frame is constructed of wood stiffened with steel, and is carried above the axles on semi-elliptic side springs front and rear. The wheels are 32 inches in diameter, and have 4-inch Goodrich tyres. The wheel base is 9 feet 6 inches.

The engine consists of eight horizontal cylinders, which lie transversely alongside one another across the car and whose heads project slightly beyond the frame on the right-hand side. The cylinders themselves are fitted, in sets of four, in aluminium water jackets, and they all work on to a common crank-shaft. In reality, the crank-shaft is made in two pieces, one for each set of four cylinders, but the two parts are coupled together direct, and thus form a continuous shaft. The cylinders have a bore of 5 inches, and the stroke is 6 inches. The engine is intended to run at any speed between 100 and 1,000 revs. per min., the changes of speed being effected by advancing or retarding the time of ignition. The ignition plugs are fitted above the heads of the cylinders, and are arranged all in a row; they are covered over by an easily removable casing, which is readily accessible from the outside of the car. A single fly-wheel, weighing 75 lbs., is mounted on the crank-shaft; it will have been realised that this shaft lies longitudinally on the left-hand side of the chassis. A single carburettor of the standard Winton type is employed. The governor is of the same form as on the touring car of this make, which, it will be remembered, includes a pneumatic system of control. Two ignition coils only are employed, and the current is supplied to them from one battery. A couple of centrifugal pumps are employed for circulating the water round the jackets and the radiating coil in front. The water tank itself forms the upper part of the jacket for the forward set of cylinders.

The transmission gear is intended for use on the top gear as a rule, and only one other forward speed is provided, and one reverse. When running normally, a direct through drive is obtained from the main clutch on the crank-shaft to the bevel gearing which drives the differential on the live rear axle, the power being transmitted through a universally-jointed longitudinal shaft. Internal and external brakes are arranged on the hubs of the rear wheels, and another brake is fitted so as to act upon the fly-wheel. The internal brakes and that on the fly-wheel are simultaneously applied by a foot pedal, and the external hub brakes are brought into operation by the same lever which introduces the high speed.

The petrol tank has a capacity of about 22 gallons, which is sufficient for running a distance of about 200 miles. The tank is of a cylindrical shape, and lies across the car just behind the driver's seat; the seat itself is placed somewhat far back. The engine is slightly in front of the middle of the car, and the steering pillar is considerably raked. No exhaust box has been fitted, but all the burnt gases from the eight cylinders are led through a single pipe which passes to the rear. From the reports received we gather that the vehicle is consequently quite as noisy when running as might be expected, in fact, one of our American contemporaries remarks that it "would cause a Gatling gun to turn green with envy."

A preliminary programme has been issued by the Club for the Motor Speed Trials to be held during the Fortnight, which include the races in Phœnix Park, Dublin, on July 4th, the 4 miles Speed Trials at Castlewellan, Co. Down, and the Henry Edmunds Hill-Climbing Competition at Castlewellan, on the 7th, the races at Cork on the 10th, and the Hill Climb at Killorglin on the 14th.

RACES, RECORDS, AND TRIALS.

THE number of entries in the A.C. of America Commercial Vehicle Contest was disappointing. Only about eleven started, and from reports to hand the Knox Company's delivery wagons entered in Class 2 for vehicles carrying 1,500 lbs. appear to have done well. The time stated for the 40 miles run was 2 hrs. 35 mins., with a consumption of 4 gallons of gasolene.

AUGUST 22ND is the date now officially fixed for the Motor Cycle Speed Trials on the track at the Crystal Palace for the machines that have taken part in the Reliability Trials. In the afternoon of the same day the Annual Open Race Meeting for Motor Cycles for the various cups presented to the Club will be run off. In the Motor Cycle Reliability Trials competitors in the private owners' class who complete the trials and gain a first-class certificate will be awarded a silver medal.

NEW YORK to Montreal and back has been now practically decided upon as the October run of the Automobile Club of America. A different route will be selected on the return journey, making the round trip about 800 miles. The outward trip will be by Albany and direct through New York State, and the return journey through Vermont, Massachusetts, and Connecticut. The competition will be a "go-as-you-please," day by day, and each competitor must make his own arrangements in regard to meals and the supply of fuel, water, &c. An observer will accompany each car, and all stops will be scored against the vehicle, there being only one control for each day, which will be at the overnight stop.

A START will be made on June 27th for competitors to try their luck at obtaining the S. F. Edge Trophy for motor bicycles, which is under the control of the Motor Cycling Club. The conditions are that the machine shall be ridden a distance of 200 miles with only two officially-permitted stops, the first at the end of 100 miles, when one hour will be allowed for rest and refreshment, and during which time the petrol tank and lubricating oil tank may be replenished, but no repairs may be effected to the machine nor adjustment made. The second stop will be for fifteen minutes at the completion of 150 miles under like conditions as at the 100 miles stop. Other stoppages for any and every cause will be deemed points against the competitor. The trials, starting on June 27th, will be held during Saturdays of that month, July, August, and September, on dates which will be duly announced. The course will be an "out and home" run, starting and finishing at a spot within 25 miles of London. Competitors will only be informed of the route selected at the last moment. Certificates will be given to competitors completing the distance at an average pace of not less than 11 miles per hour, and a speed exceeding 17 miles per hour will entail disqualification. A second prize of a gold centre medal, and a third prize of a silver medal will be given by the Motor Cycling Club. The entrance fee is 5*s*., and each competitor is entitled to make three attempts to obtain the trophy.

MOTOR BICYCLE RECORDS.—On the 21st inst. Fred Chase at Canning Town on a Chase motor cycle (M.M.C. engine) attempted to lower the hour record. The pace was so hot, however, that at the thirteenth mile both his tyres had completely given out, being worn through to the canvas. Up to this point, however, he had lowered every record time, the chief times being as follows:—

STANDING START.

	mins.	secs.		mins.	secs.
1 mile	1	15 2-5	... Previous best	1	23 4-5
5 miles	5	57 2-5	... ,, ,,	6	7
10 miles	11	35	... ,, ,,	11	58
13 miles	15	6 4-5	...		

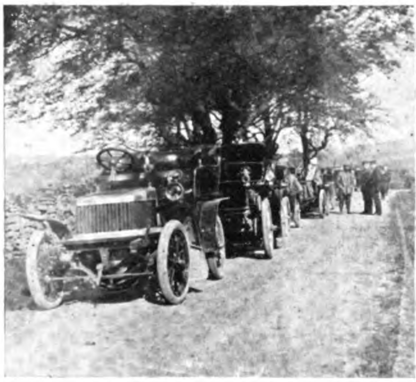
FLYING START.

2 mile	1	6 3-5	... Previous best	1	9 2-5

VIENNA MOTOR BICYCLE MEETING.—At this meeting, on May 20th, organised by the Austrian Touring Club, the winner of the 100 kilometre race was Wondrich, on a Laurin and Klement machine, in 1 hour 27 min. 21⅕ secs. In the hour 68·630 kilometres were covered. The same rider also did best in the kilometre race, being timed for 50 secs. In the 10 kilometre race for Motor Cycles, Erckel, on a Puch machine, was timed for 9 mins. 18 secs.

MOTOR pacing will be used on June 6th at the Carwardine Gold Cup Race over 100 miles on the Crystal Palace track. The number of starters is limited to ten.

THE SCOTTISH AUTOMOBILE CLUB'S HILL-CLIMBING COMPETITION.



The competing cars lined up on the top of the hill.

Mr. Adam, Chairman of the Western Section, on his 10-h.p. Wolseley.

Another view of the cars waiting their turn to descend on the top of the hill.

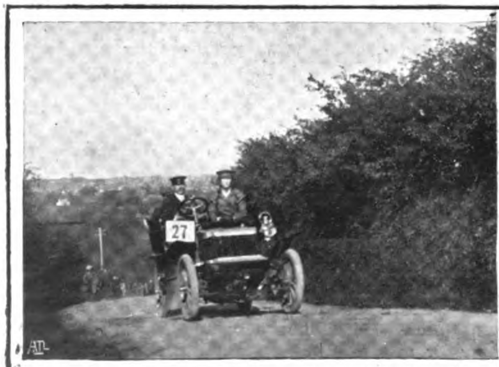
Lanark Hill Climb. Scottish Automobile Club.

ON Saturday afternoon last the Scottish Automobile Club conducted a hill-climbing competition on Kirkfield Hill, near Lanark. The measured distance traversed by the cars was 701 yards, this being marked off on the steepest portion of the hill. The average gradient for this distance is about 1 in 9, and the steepest parts are probably about 1 in 5 or 6; some 440 yards have an average of not less than 1 in 7. A flying start of about 120 yards was allowed, but as this was over rising ground, the gradient of which varied from about 1 in 25 to 1 in 18, the advantage gained by it was not great, and for the steam cars in particular it was insufficient to enable them to obtain a full head of steam or a high rate of speed.

The judges were the Right Hon. Sir J. H. A. Macdonald, K.C.B. (Lord Justice Clerk of Scotland, and President of the Club), Mr. Norman D. Macdonald (Chairman), Dr. Blair, of Jedbury, Mr. John Wilson, and Mr. Stephen Smith. Mr. J. H. Irons acted as starter, Mr. J. R. Smith, C.A. (Hon. Sec.) as marshal, and Messrs. Alexander Blair, of Glasgow, and J. M. Inglis, of Edinburgh, as time-keepers. There were 28 entrants in all, and the cars were divided into three classes—the classification being according to the number of cylinders. Of single-cylinder cars there were two, of twin-cylinder cars 16, and of those having four or more there were ten. The rules adopted provided that competitors must be members of the Club, although entries were accepted from firms in which the principals were members. The cars were to be bona-fide touring vehicles and were not only to carry their full complement of passengers, but were to be driven by members of the Club.

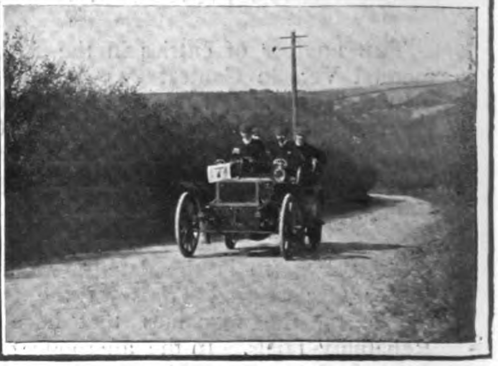
The start was made at about a quarter to three, and the vehicles were sent up the hill one by one. The operations were considerably facilitated by the employment of a field telephone, which was laid between the starting point and the top of the hill, for the hill itself is not only exceedingly steep but has many sharp turns in it. The results are given below in a tabulated form where the various competitors are arranged in order of merit according to the average speed in m. p. h. made by them over the course. In Class 1 it will be seen that the 6-h.p. Argyll won easily; a protest was, however, entered by Mr. Peacock that the vehicle ought to have had a four-seated body and to have carried four passengers. In Class 2 the best time was made by Mr. Prosser on his 10-h.p. Wolseley, which, considering the gradient, the power of the car, and the load carried, made an excellent performance. In Class 3 Mr. Sinclair's Gardner-Serpollet steam car was placed first, an average speed of over seventeen miles per hour being maintained by it. Mr. Paterson's car climbed the hill using ordinary benzine as a fuel, he having come from Aberdeen on the previous day, and having been unable to obtain any petrol in Lanark. It was too late to make arrangements to obtain a supply, but he succeeded in finding sufficient benzine for his purpose. Subsequently to Mr. Sinclair's performance, an exhibition run was made with his car in the hands of a professional French mechanicien, when under the same circumstances as before it travelled at 27 miles an hour over the course.

The event was highly successful from every point of view, and the co-operation of the police was much appreciated. It proved to be a



Mr. H. E. Smith's Argyll car towards the top of the hill, driven by Mr. Govan.

Mr. William Weir's 12-h.p. Darracq taking a rest on the hill, Mr. H. Kennedy driving.



A 12-h.p. Albion car driven by Mr. T. B. Murray, of the Albion Motor Car Co., Ltd.

Lanark Hill Climb. Scottish Automobile Club.

very pleasant outing, and was favoured with the finest of weather conditions. Considerable interest was taken in it locally, and, from a business point of view, little more could have been desired. The test was a genuine one; it was well arranged, and was admirably carried through.

No.	Owner.	Maker and H.P.	No. of Pass.	Speed. M.P.H.
	Single-Cylinaer Cars.			
1	A. W. Steven	6-h.p. Argyll ...	2	9·43*
2	J. A. Peacock	5 ,, Peugeot ...	2	7·04
	Two-Cylinder Cars.			
4	H. Prosser	10-h.p. Wolseley ...	4	9·42
17	J. Hunter and C. J. Campbell Steen	10 ,, ,, ...	4	8·31
6	W. A. Smith	8 ,, Argyll	4	8·1
28	A. W. Barr	7½ ,, Wolseley ...	4	7·06
27	H. E. Smith	10 ,, Argyll	4	6·62
3	Andrew T. Reid ...	10 ,, White (steam)	4	6·43
13	Jas. T. Forgie	7½ ,, Wolseley ...	4	6·34
11	Robert Forrester ...	7 ,, Panhard ...	4	6·26
7	Albion Motor Car Co...	12 ,, Albion ...	4	6·12
10	Ed. A. Brown	10 ,, Argyll	4	5·71
12	John Adam	10 ,, Wolseley ...	4	5·03†
14	J. H. Mathieson ...	10 ,, White (steam)	4	4·0
9	Wm. Weir	12 ,, Darracq ...	2	3·5†
5	J. H. Patterson ...	8 ,, Peugeot ...	4	—‡
15	D. L. Auchenbole ...	10 ,, White (steam)	4	—‡
	Four or More Cylinder Cars.			
16	G. P. Sinclair	20-h.p. Serpollet (steam)	4	17·2
26	W. Holms-Kerr ...	20 ,, Wolseley ...	4	14·46
25	Wm. Weir	24 ,, Darracq ...	4	13·09
24	Geo. Macmillan ...	16 ,, De Dietrich ...	4	12·14
18	Hugh Reid	12 ,, Gardner-Serpollet (steam)	4	11·18
22	R. Douglas Croall ...	10 ,, Napier ...	4	8·81
21	J. H. Paterson ...	12 ,, Peugeot ...	4	7·31
19	James Ballantine ...	16 ,, Daimler ...	4	—§

* Protest entered that it should have carried four passengers.
† Stuck on hill. ‡ Did not start.
§ Disqualified; professional driver.

The top of Padley Wood Hill, the scene of the Hill Climbing Competition organised by the Sheffield and District Automobile Club.

Lincolnshire Automobile Club.—This club held their first meet of the season at the Royal Hotel, Woodhall Spa, last Saturday week. Dr. White, of Swineshead, on a New Orleans, was first to arrive. Others followed in quick succession, viz., Dr. Reckitt, of Boston (Peugeot); Dr. Miller, Wrangle; Dr. Crompton, Benington, on a Peugeot; H. T. Benson, J.P., Market Deeping, on a Pick; Mr. C. J. Parker, J.P., and Mrs. Parker, Grantham (Daimler); Messrs. J. H. Carter and Clark, Market Deeping (Benz); Captain Newsum, Lincoln; Captain Boothby, Lincoln; Mr. W. R. Pennell and Mr. J. R. Richardson, Lincoln (Durkopp); C. W. Pennell, J.P., and Mrs. Pennell, Lincoln; Captain Cole, J.P., and Mrs. Cole (18-h.p. Durkopp); Sir Hickman Bacon (Wolseley); Messrs. A. A. Padley and Mrs. Padley, Market Rasen (Beaufort); W. B. Jevons and Mrs. Jevons, Market Rasen (De Dion); Parsons Wright; C. H. Gilbert, Lincoln; C. Nelson; Rev. R. Simpson, Spilsby; G. Wilkinson; B. Smith, Horbling Hall (Progress); R. Gleed, J.P.; Dr. Gilpin; F. Richardson; and J. D. Sandars, J.P., Gainsborough (De Dion). In all some 22 cars turned up, besides about half-a-dozen bicycles, tricycles, and quads.

A fully attended Committee meeting was held, Captain Cole presiding, and after very full discussion, the following resolution was passed:—"That the Committee consider the advantages the members receive from affiliation with the A.C.G.B.I. are so small that they recommend members to decline to affiliate. That a general meeting of the Club be called at the White Hart, Sleaford, for Thursday, May 28th, to decide the matter, and that meanwhile a vote of the members be taken by post."

Invitations to the Club from Captain Cole, Roxholme Hall; Major Errington-Josse, Grimsby; G. Linnell, Market Deeping; Dr. Gilpin, Bourne; Dr. Hancock-Steil, Colsterworth; Sir Hickman Bacon, Thonock Hall, were gratefully accepted. A sub-committee was appointed to draw up a list of fixtures for the season, the club to meet at least once a month during the summer.

Some 60 or 70 sat down to tea. The day was fine and pleasant, and the roads in good condition. Rain came on, however, as evening advanced, but was at no time heavy.

YORKSHIRE AUTOMOBILE CLUB.—Last week, upon the invitation of Mr. Owen Brooks, many members visited the Tivoli to see the Viagraph Film which had been taken of the start from Leeds of the cars entered in the Scottish Automobile Club's Non-stop Trial.

Afterwards a Committee Meeting was held at headquarters, attended by Messrs. H. Benn, Jackson, Faiers, Whitaker, Kirk, Winn, and Dougill (Hon. Secretary). The report of the visit to Ireland was read and confirmed by the Committee, and instructions given to secure a piece of ground near Ardscull from which the Club members and friends could view the Gordon-Bennett Race, and also a piece of ground near by on which to erect ten or twelve tents. The field commands a view of between two and three miles of straight road.

The following new members were elected, being duly proposed and seconded: Mr. W. Rodger, Bradford; Mr. C. R. Owen, York; Mr. Blackburn, Leeds; Mr. F. Margerison, Bradford; and Mr. W. N. Drew, Ecclesfield.

THE KENT AUTOMOBILE CLUB.—Last Saturday, under the above title, it was determined to found a Kent County Club for automobilists. Mr. Harold Cash, of Gravesend, who is acting as Secretary *pro tem.*, has been the prime mover in bringing matters to a focus for the formation of this body. A provisional Committee has been elected as follows:—Dr. Firth (Gravesend), Mr. J. E. Austen, J.P. (Detling), Mr. H. Cash (Gravesend), Mr. E. Shrubsole (Rochester), Dr. Woodman (Rochester), Mr. F. W. Ball (Maidstone), Mr. E. Packman (Ramsgate), Mr. Cornell (Tonbridge), Mr. Hallowes (Ashford), and Mr. A. Booth-Hearne (Rochester). An adjournment to dinner was made after the meeting to the Royal Star Hotel, where prosperity to the Club was drunk with much enthusiasm.

THE Southampton County Motor Club now numbers about thirty members, who join heartily in the pleasant Wednesday and Saturday runs organised by the indefatigable Honorary Secretary, Mr. P. G. Headland. The outings for June are:—June 3rd, Ringwood, Fordingbridge, and back; 6th, Reading, *viâ* Basingstoke, and back; 10th, Southsea; 13th, Littlehampton; 17th, Milford-on-Sea; 20th, Aldershot, *viâ* Winchester; 24th, Petersfield, *viâ* Fairoak and Durley; 27th, Marlborough, *viâ* Romsey and Andover, and back *viâ* Salisbury. On Whit-Monday the run will be to Weymouth, *viâ* Dorchester, and back *viâ* Poole, Bournemouth, and Christchurch. The Hon. J. Scott Montagu, M.P., is the President of the Club, and the headquarters are at Scullard's, Above Bar, Southampton.

IN delightfully fine weather, and with roads in perfect condition, the South Wales and Monmouthshire Automobile Club, starting from the Royal Hotel, Cardiff, had a very pleasant run last Saturday to Brecon, where they were hospitably entertained to luncheon by Captain D. Hughes Morgan. The road lay through some of the most charming mountain and woodland scenery in South Wales, the luncheon being honoured by the Mayor and Corporation of Brecon, about 80 seats being provided by Captain Morgan. The visit was made quite an official function by the welcome given to the automobilists by Mr. Lewis W. H. Jones, the Mayor, who is himself a motorist. The return journey was made *viâ* Abergavenny.

THE Leicestershire Automobile Club's run on Saturday last was to Oakham by way of Uppingham, which was a severe test for some of the cars, as this is about the stiffest road out of Leicester. The much-dreaded Wardley Hill was successfully surmounted by the whole party. Thurnby, Houghton-on-the-Hill, Billesdon, Skeffington, Tugby, and East Norton were rapidly passed, and in very quick time the quiet old Rutlandshire town of Uppingham was reached. Turning to the left without even stopping to glance at the well-known school of the place, the party made, by way of Preston and Manton, for Oakham, where tea had been arranged for at the Crown Hotel. Rather more than thirty sat down to tea, and the company included:—Colonel Lionel Powell and Mr. T. C. King (Vice-Presidents), Mr. H. R. Harding, Mr. and Mrs. J. W. Hemmings, Mr. A. McAlpin, Mr. R. E. Parker, Mr. W. Dalrymple, Mr. J. Dalrymple, Mr. T. C. and Mr. S. W. Clarke, Mr. Hargreaves, Mr. Orson Wright, Mr. V. Oliver, Mr. J. Bennett, and others. The President of the Club, Mr. E. G. Mawby, started out with the party, but was not able to make the whole journey. The return journey was commenced soon after 7 o'clock, and the first stage of the journey was to Melton Mowbray, passing through Somerby and Burton Lazars. After a short halt at the hunting town, a start was made for Leicester, which was reached about 10 o'clock.

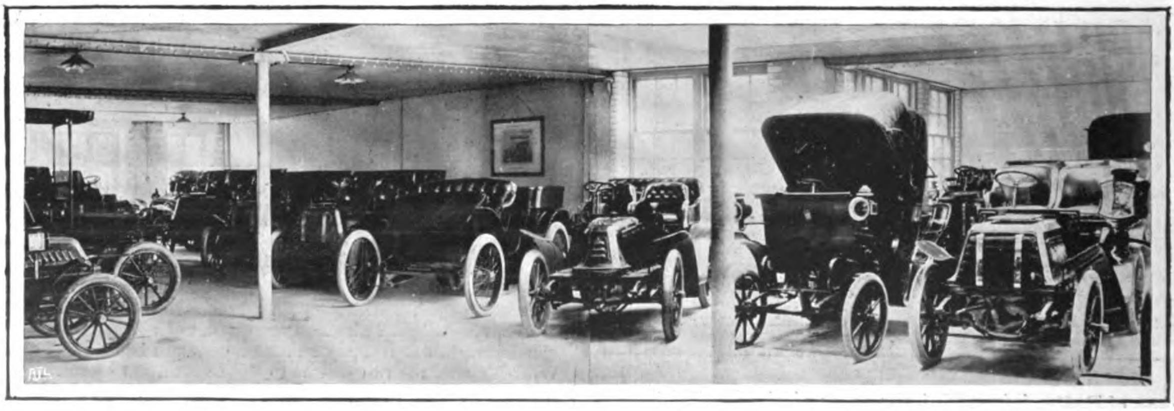
THE Third Monthly run of the Reading Automobile Club, in connection with the Challenge Cup Competition, will be held on Monday next (Whit Monday), when the competitors will drive to Savernake Forest (32 miles) and back, *viâ* the main Bath Road. The start will be from the Club headquarters at 10 a.m., and a picnic lunch in the forest will lend considerable interest to the outing. The possibility of bad weather for the picnic need have no terrors for members joining the run, as there is hotel accommodation handy at the proposed luncheon spot.

NEW racing rules have been adopted by the American Automobile Association, in which the most important change is the new rule which gives the classification of vehicles. This covers two classes of automobiles, those expressly designed for racing purposes and those designed primarily for general use. For racing cars two divisions are suggested, one for all weights and one for cars weighing under 1,200 lbs. In the other class there are four divisions, viz., all weights, under 1,800 lbs., under 1,200 lbs., and under 800 lbs., supplies included in each case.

THE LONDON MOTOR GARAGE COMPANY'S NEW PREMISES.

NOTHING could be more appropriate to the commencing season than the opening of the London Motor Garage Company's new premises at 33, Wardour Street, practically within a hundred yards of Piccadilly Circus. The new garage is a wonderfully up-to-date installation from every point of view. Many other similar institutions in London have been converted warehouses, livery stables, or what not. The present building is lofty, and all its various floors may be regarded as on the ground floor to all practical intents and purposes, owing to the magnificent lift accommodation with which the premises are provided. This is a huge electrically-driven affair which is capable of taking up two full-sized motor vehicles at once from the ground floor to the very top of the building. It works with ease and rapidity under full load, and has the great advantage of being practically "fool-proof," for on mounting it is merely necessary to press the button corresponding to the floor at which it is desired to arrive, and the lift automatically starts, ascends to the particular level in question, and there automatically stops. This, we believe, is the first lift in this country in which this principle has been adopted on so large a scale. The total space available on the various floors for storing customers' cars amounts to 30,000 square feet. In addition to the basement and sub-basement for washing and cleaning cars, the roof of one part of the building, which is easily accessible from the lift, is also fitted up as a cleaning place. The basement is provided with a repair shop and a very extensive pit lining one entire side of the building and covered with removable boards so as to be covered in while not in use. The pit enables about thirty cars at once to be repaired.

A noticeable feature of the installation is the petrol store, which, for the first time, the London County Council has licensed for a supply of 200 gallons. This is owing to the special precautions taken, and to the storeroom being built according to the Council's own specification, while, in addition, all the petrol is stored in separate two-gallon tins. The second floor of the building comprises a large, spacious, and well-lighted showroom for new cars, and amongst these we noticed some very modern Panhards, several new Mercedes cars, Magnet and Pipe cars, and quite a number of Lanchesters. On the fourth floor is a most extensive collection of stores comprising in all some 5,000 pigeon-



A view of a part of one of the floors in the London Motor Garage Company's new building.

holes, in which are kept the spare parts for practically all the leading types of motor vehicle, and the stores comprise such important items as tyres of all kinds, and even complete wheels for the various makes, while a large stock of speed gears, axles, brakes, lamps, and battery boxes is kept in stock. A leading and most useful feature of the establishment consists in a charging plant for electric cars arranged in the basement. Here, as many as four different cars of the ordinary brougham type can be charged simultaneously, and there is a little rotary transformer as well for reducing the voltage from the mains to provide for the charging of ignition batteries.

The new garage is open both day and night from one end of the year to the other, and an adequate staff both of French and English mechanics is always ready at hand. An excellent feature is that of a chauffeurs' room in which papers and every convenience is supplied, and in which motor servants can remain while their employers' cars are on the premises, or at any time when their services are likely to be required. Every floor is connected with the main office by telephone, and in every respect the garage is probably the most up-to-date establishment of its kind in London. It has been opened at an auspicious time of the year, just as the motor season is commencing, and considering its central situation, so close to Piccadilly and Regent Street, will doubtless prove of the greatest value to the automobilists in the Metropolis. Mr. Frank Atherley is managing director of the Company owning the establishment, and the enormous progress made in bringing the garage to its present state of perfection is mainly due to his energies, backed up by that enthusiastic automobilist, Mr. Claude Watney.

THE LONDON MOTOR GARAGE Co. Ltd.
33
THE LONDON MOTOR GARAGE Co. Ltd.
37
LA VOITURE
PIPE
MAGNET CARS

The new garage premises of the London Motor Garage Company, Limited, 33-37, Wardour Street.

Torquay is shortly to have a service of motor omnibuses.

A motor mowing machine has been acquired by the Norwich Corporation for the public gardens.

The Right Hon. Sir John Macdonald has been appointed to the honorary colonelcy of the Motor Volunteer Corps.

The next auction sale of motor cars and cycles at the City Garage, 34, Queen Street, E.C., will be held next Wednesday, June 3rd, commencing at 3 p.m.

By a printer's error last week the announcement of the extensive showrooms for motor cars being opened at their Victoria Works, Lambeth, by the Brush Electrical Engineering Company, was made to read *British* Electrical Engineering Company.

By way of contrast, it is interesting to note that the 6½-h.p. Peugeot car which Mr. Peacock drove in the Glasgow-London Non-stop Run was sent back to Glasgow by the Clyde Shipping Company's steamer at a cost of £1 8*s.* 4*d.* By railway it would have cost between £6 and £7.

Last week the Prince of Monaco was to have read a lecture entitled "Some Physical Problems of the Ocean," before the Royal Institution, but unfortunately, through a motor bicycle accident, he was prevented from attending. His discourse was read by Mr. J. Y. Buchanan, M.A., F.R.S., who acted as his proxy.

Mr. J. Benett-Stanford, who has been engaged at Ringwood Camp with his car in connection with manœuvres under Col. Le Roy Lewis, has been recommended for a commission in the Motor Volunteer Corps by the Officer Commanding. Mr. G. D. Chapman's name has also been put forward for a like honour.

The Motor Castings Company, the formation of which we mentioned last week at 101, Grays Inn Road, will be entirely in the hands of Mr. James T. Skinner, as we understand Mr. C. E. Rush, having started the business for Mr. Skinner, will, in all probability, be shortly taking up an important appointment in South Africa.

New members elected to the Society of Motor Manufacturers and Traders are:—The Ariel Motor Company, the Gobron Motor Company, the Mo-Car Syndicate, the Motor Car Company, Messrs. H. E. Hall and Co., Messrs. Laurie and Marner, and Messrs. Pritchetts and Gold. The members of the Society now include 90 firms.

June 10th and 11th are set aside by Messrs. C. S. Rolls and Co. for a reception at their Lillie Hall Garage, Earls Court, from 4 to 6 p.m., when a thorough inspection of the whole of the works, repair department, &c., in operation can be made. In addition to one or two historical cars which will be on view, entertainment will be provided by a band and cinematograph views of the Paris-Madrid Race. Lady automobilists will evidently be welcomed, as tea and light refreshments are to be provided.

THE unfortunate accident in the motor bicycle race at Bristol, in which several spectators, including children, were killed and injured, is a powerful reminder, if indeed any were needed, that it is not wise to race motor bicycles or any other bicycles on a track with corners, especially when these are inadequately banked, and the spectators are allowed to crowd near them.

A SERVICE of omnibuses has been started in Edinburgh by the Edinburgh Motor Omnibus Syndicate, Limited, running from Preston Street to Haymarket Station, *viâ* the Bridges, the General Post Office, and Prince's Street, at *2d.* for the full distance. The vehicles have been constructed by Stirlings, Limited, and are of similar make, only of less power, to the Stirling 'bus destined for Johannesburg, which we illustrated last week.

LAST Saturday Mr. Frank Morriss, of King's Lynn, unearthed a carefully planned police trap on the road from Lynn to Hunstanton. By his prompt action in warning, by telegram, the Automobile Club and all clubs surrounding his immediate neighbourhood, motorists fortunately had notice in time to render the trouble taken by the police abortive. The exact locality of the trap was between Snettisham and Heacham.

THE Aero Club arranged a balloon ascent last Saturday from the Ranelagh Club, when the *Graphic* balloon, piloted by Mr. Frank Butler, accompanied by his daughter, Miss Vera Butler, made a successful ascent, reaching an altitude of 7,000 feet. General Colville and Mr. Brabazon, of Trinity College, Cambridge, also took part in the ascent. At the same venue, on June 6th, a night ascent will be made at 9.30 p.m., and on the 10th another in the afternoon at 4.15.

"THE Shropshire Association for the Protection against Dangerous and Reckless Motor Car Driving"—heavens, what a title!—was formed last week at Shrewsbury with the object of instituting legal proceedings against automobilists driving with recklessness. It appears that there was one gentleman present who had heard of Mr. Long's Bill which is being introduced for the purpose of dealing with this matter, and he proposed that action should be deferred until after the introduction of this measure, but all to no purpose, and a committee was duly appointed with the object of drawing up rules, &c.

A PLEASANT greeting was organised for the King during his recent visit to Edinburgh by Mr. John Wilson, of Green Park, Edinburgh. He gathered together a number of Edinburgh automobilists, and having entertained them to afternoon tea, the owners arranged their cars by the curve of the road leading to Dalkeith Palace gate, where they awaited the arrival of their Majesties. The 25 cars made quite an imposing show, and through the influence of Mr. John Macdonald, the chairman of the Scottish club, the automobilists were enabled, through the Chief Constable, to secure a very advantageous position.

THE Leipzig municipal authorities have prohibited automobiles from using any public roads in the neighbourhood of their city. Needless to say the German Automobile Club is moving with considerable vigour in opposition to this extraordinary action.

M. DARRACQ has been appointed an officer of the Legion of Honour.

LAST week Fournier's Mors car, with which he covered the mile, in America, in 51⅘ secs., was badly smashed between two trolley tramcars in New York.

OWING to the large increase of automobilists touring through Switzerland, a motor car pilot service has been organised in that country with headquarters at Zurich by way of experiment.

THE number of licensed automobilists in Chicago is 1,100, and the last day for renewing for the current year was April 30th. On that day an extraordinary scene is reported to have taken place when about 800 of these licence holders called at the City Hall to renew their permits.

MR. SANTOS DUMONT has been continuing his evolutions with his small airship, No. 9, and was even more successful than on previous occasions in alighting at different points, and again satisfactorily rising into the air. At one moment, however, an accident seemed imminent as he rose after having come to earth for a short period. The balloon portion of the airship was observed to be rapidly deflating. Mr. Dumont instantly descended, when it was found that the workmen had omitted to close one of the gas valves. The escape of hydrogen was made good by the introduction of fresh gas, and the aeronaut re-continued and successfully terminated his experiments.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories either as their principal or part of their objects.]

Hans Renold (Limited).—Capital, £100,000 in £1 shares (40,000 six per cent. non-cumulative preference). Object, to acquire the business now carried on at 3, Brook Street, Manchester, by Hans Renold, as chain makers, engineers, &c.

Ilfracombe Motor Coach Company (Limited).—Capital, £4,000 in £1 shares. Object, to provide a service for passengers and goods between such places as the company may determine.

Mobile Motor and Engineering Company (Limited), Rosebery Buildings, John Bright Street, Birmingham.—Capital, £3,000 in £1 shares. First directors, M. Lintine (chairman), D. F. Lintine, and L. Antweiler.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published May 28th, 1903.

11,114. J. B. FERGUSON and G. S. HAMILTON. Steam-motor road vehicles.
12,311. A. POLLAK. Driving and steering mechanism.
12,505. C. H. WORSNOP. Lamps and portable searchlights.
12,824. HOZIER ENGINEERING COMPANY. Brakes.
13,452. J. M. M. TRUFFAULT. Anti-vibration devices.
13,765. C. F. WYCKOFF and J. R. CHISHOLM. Internal combustion engines.
15,857. W. J. OSBORN. Burners for liquid fuel.
17,412. W. J. LLOYD and W. PRIEST. Bicycle motors.
28,013. CHLORIDE ELECTRICAL STORAGE COMPANY. Negative electrodes.

Applied for in 1903.

Published May 21st, 1903.

4,135. — PURSER. Non-skidding tyre covers.
4,379. PANHARD AND LEVASSOR. Lubricators.
4,758. — LEMALE. Internal combustion turbo-motors.
6,952. — GOODSON. Electric igniters.
6,953. — GOODSON. Electric igniters.

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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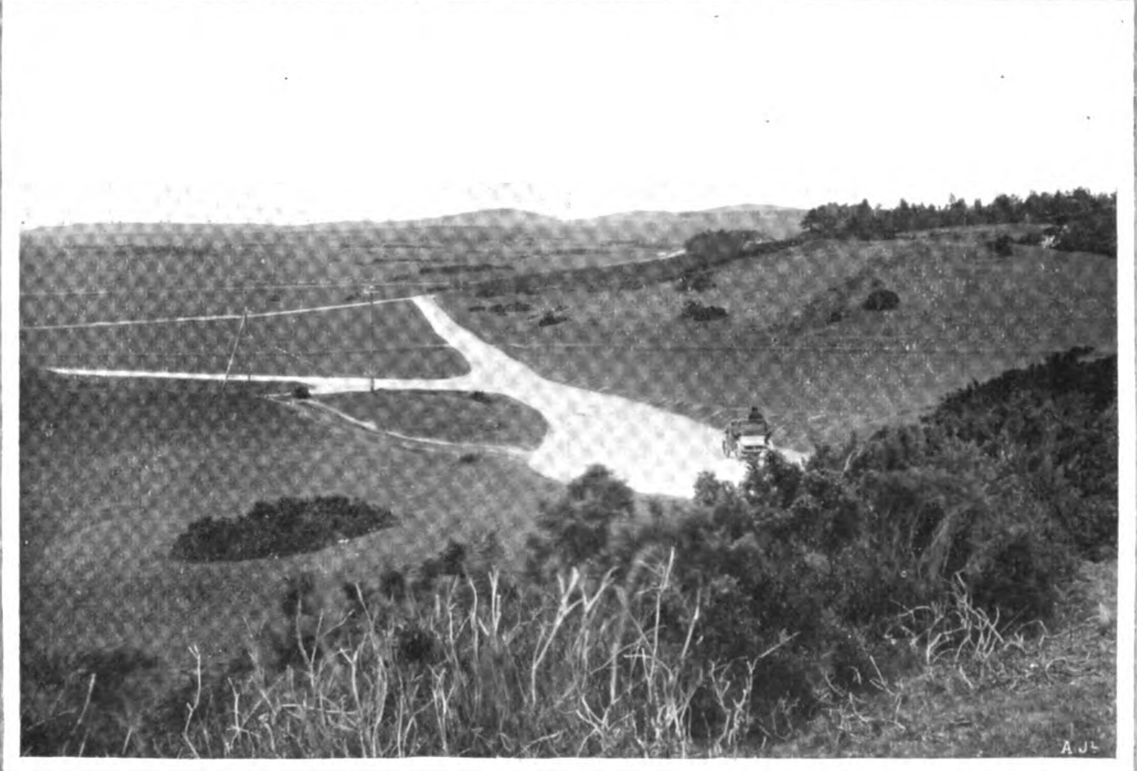

(Photo by Lawrence, Dublin).

THE IRISH FORTNIGHT.—A View on the Gordon-Bennett Course on the road from Kilcullen, showing the Curragh. The course winds to the right, and, after the right angle turning, cuts across the view (parallel with the horizon) to Kildare.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
*June 13 ...		... Gymkhana at Ranelagh.
June 20 ...		... Manchester Auto Club Hill Climb.
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park; Motor Cycle Time Trials; Viceregal Garden Party.
July 6 ..		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy; 4 Mile Motor Cycle Race (Newcastle, co. Down).
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork. Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
*July 24 ...		... 100 Miles Quarterly Trial.
July 24–25		... Southport Speed Trials.
*August 10-22		... Tourist Motor Bicycle Reliability Trial.
*August 22		... Annual Open Race for Motor Bicycles.
*September		... The 1,000 Miles Trial.
*November		... Side-Slip Trials.
1904.		
		... *Light Van Trials.
*Feb. 12–24		... Crystal Palace Exhibition.
May. ...		... Electrical Vehicle Trials (6 days).

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
June 18, 19, 20 ...	Automobile Club Fêtes—Paris.
June 18–28 ...	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18	Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 20–21 ...	Circuit des Ardennes.
June 28	Laffrey Hill Climb.
July 5	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 12-19 ...	Ostende Automobile Week.
July 19	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16 ...	Race Trelex-Saint-Cergves (Swiss A. C.).
Sep. 6–13 ...	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September ...	Udine Exhibition (Italy).
Oct. 15–21 ...	Leipzig Exhibition.
Nov. 15	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

A MOTHER OF MANY BILLS.

WE have throughout been in general agreement with the legislative proposals of the Club Committee, and, subject to criticism on detailed points, have accorded them support. At the same time we really feel compelled to record a mild protest against the large number of different proposals and Bills which the Club Committee has put forward during the last year. The suggestions change almost with the rapidity of the cinematograph, and their details are re-arranged with the unfettered freedom of the kaleidoscope. Scarcely do we begin to consider seriously one Bill, when, Heigh, presto! the Club puts forward another measure in which some of the most important of the previous proposals are omitted and others modified. The whole business is becoming a "phantasmagoria in itself." Of course a certain amount of modification as the result of consideration and argument is necessary in all legislative proposals, but we really did think that the Bill published by a contemporary last week, and reprinted from its columns by ourselves, was the final and complete draft, and, except as regards the trailer question, we were in full agreement with it. Now, however, yet another Bill has been projected which differs in some essential particulars from the proposed measure to which we referred last week. In considering the situation generally, we pointed out that it was of considerable importance that the automobile world, through their mouthpiece the Legislative Committee, should speak with no uncertain voice, so that those representing the interests of automobilism in the House of Commons would not have to meet the reproach that automobilists as a body "do not know what they want, and won't be happy till they get it." This referred to the points in dispute between the Legislative Committee and Lord Russell and his supporters, and these points have largely been embodied in both the recent bills, but it has always appeared to us that a multiplicity of proposals put forward one after the other tended to weaken the weight of any measures finally suggested. In fact, as we said a fortnight ago, "the only consideration that may possibly discount the attention the Committee's last Bill will receive may be the number of different proposals that they have previously put forward."

We think, therefore, that the only justification for the publication of yet a third proposal (when a very good bill was already in type) would be that the last measure were a great improvement on the last but one. We altogether fail to see that it is. We alluded on May 23rd to the ambiguity and confusion in which the trailer question was left by the Bill we published on that date. The last draft does nothing whatever to remove it. It alters the phraseology of the section devoted to the subject by substituting 'light locomotive' for 'vehicle' in the definition, but otherwise it leaves the matter exactly as it was at that date.

The most serious objection, however, to the latest measure is to be found in Section 8. Section 8 in the last Bill corresponds with Section 9 in the last but one. In the former measure was included a proposal that when a police officer took the number of a motor car for the purposes of prosecution he should bring forward independent evidence that he called upon the car to stop, and that it refused to do so. This proposal, of which we have always been in favour, is highly important. It did not appear to us to go far enough, but it recognised the necessity of independent confirmation of police evidence in such cases. Will it be believed that this safeguard is entirely omitted from the last Bill? Instead of the words "such evidence must be confirmed in some material particular" we have the words "the prosecutor or informant shall by evidence prove," and that is a very different thing, for it may mean, and will certainly be interpreted to mean, either his own evidence only or that of his brother constables, and is giving the whole thing away. Our own columns, the columns of every automobile journal, and the columns constantly of the daily press, make it sufficiently plain that in cases in which constables are concerned to obtain a conviction, and above all in motor car cases, their uncorroborated testimony is not to be trusted. No automobilist has ever been in love with the principle of numbering for its own sake. We and all others who have accepted it have merely done so as a necessary concession, and one that must be flanked by adequate safeguards. If automobilists are to be compelled to carry a number and no independent evidence is required to confirm the police, they will be in much worse case than they are at present. It is needless to elaborate the arguments on this point. They have been dealt with sufficiently by ourselves and others in the immediate past.

It might be thought that the section giving costs against the originators of a prosecution, if they proceed against the wrong person, will act as a check. Possibly that is the Committee's idea. But such a view is quite untenable. The policeman will not pay the costs in such cases, and in how many cases will costs be granted? Only those few in which the motorist accused can absolutely establish an *alibi*. It is often exceedingly difficult to do this, and on club runs it will mean that every single participant may possibly be had up.

The new Bill provides in elaborate legal phraseology for appeal to the Assizes, but it withdraws the right of appeal to Quarter Sessions. We really cannot see why the right of appeal to Quarter Sessions, if anybody likes to make use of it, should be withdrawn, and with the judges of the King's Bench as prejudiced as they appear to be at present we do not think there is much advantage in getting this provision through. We were originally in favour of some such section being introduced, but have subsequently seen reason to doubt its utility. At any rate, it is scarcely worth fighting for, for a man who is fined, say £5, by magistrates would be wanting in all sense of proportion, whatever his legal advisers may say, should he appeal either to Quarter Sessions or the Assizes. Even if he won his appeal in either case he would lose at least four times as much as he is fined through costs and other expenses.

THE JUGGERNAUT.

THE correspondence under the egregious title of the "Social Juggernaut" still goes merrily on. We are thankful to say that hitherto few motorists of standing have taken any part in it, and the majority of the letters published appear to be from highly irritable and generally ignorant opponents of the movement. The extreme degree of animosity displayed is only equalled by the futility of the suggestions put forward. Of course, if there is one thing more certain than another, it is that motor cars do practically no harm to the high road as compared with ordinary horse traffic, though those disingenuous writers who every day take up columns in the *Daily Telegraph* continue to lay stress on the great injury done. By reiterating a misstatement of this kind sufficiently often it is apparently presumed that people will be brought to believe it. One of the correspondents is looking forward to the coming Government Bill affording opponents of motoring what he is pleased to term just relief. We do not quite know what this may mean, but we gather he has in view restriction of the speed limit with numbering added. Should the Government Bill fail to satisfy the anti-motorists, they are urged to give expression to their discontent at the polling booths. Bearing in mind the *rôle* which the motor car has played in recent elections, this suggestion has its humorous aspects. We once suggested that all motorists should combine only to place motor cars at the service of candidates who were willing to support a progressive legislation. There is little doubt how the vote would go; at any rate in most country districts, if a phalanx of motor cars were ready to convey voters to the booths in support of candidates favourable to a satisfactory measure, while the reactionary candidates were only supported by the time-honoured horse-drawn vehicle, we can guess the result.

What is instructive in the correspondence, however, is the large amount of bitter feeling on the subject which has found expression. It would be, perhaps, too much to assume that the writers are representative or that the feeling against the motor is as strong as their letters would lead us to suppose, but they do lend colour to the belief that in certain places the automobile has become seriously unpopular—even the *Punch* cartoon following the lead this week. This is, of course, the result of the thoughtless behaviour of individuals which the Club and the automobile press generally, has done its utmost to restrain, and if anything could emphasise how prejudicial the inconsiderate behaviour of such individuals is, it is the excuse that they have afforded to the cranks and busybodies for flooding the Press with their fatuous suggestions.

While referring to this subject it may not be irrelevant to point out that there is no point on which in country districts more feeling is caused than by the occasional want of consideration displayed by drivers to the safety of dogs on the high road. The dog, of course, is often a great nuisance, and their irresponsible way of manœuvring in the middle of the road is often a source of considerable danger to drivers, and a sort of idea has grown up that it is useless to attempt to dodge them, but it should be remembered that one dog driven over will turn a whole village into anti-automobilists, and if for no other reason a moderate degree of thoughtfulness in this matter should be cultivated.

In fact the whole outburst of hysterics that has been occasioned in the Press of this country by the Paris-Madrid Race has certainly a very un-English appearance. Anti-motorists are fond of asserting that the motor car is a French invention, and automobilism a fad imported from that country. However that may be, a good many of the characteristics—the want of restraint and sense of proportion—that characterise the least attractive portions of the French Press in times of political crises seem to have been introduced into the discussion of the automobile question at the present moment by its opponents. If the present flood of vituperance goes on unchecked, we shall in all probability find in future dictionaries motorphobia defined as a special form of hysteria which broke out in the early summer of 1903.

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THE RESTRICTION OF CYLINDER CAPACITY.

The proposal to solve the racing problem by restricting the cylinder capacity of the motors fitted to the competing vehicles is receiving general support. Mr. Scott Montagu has addressed a well-considered letter to *The Times* on the subject, in which, after pointing out the difference in the conditions between the Gordon-Bennett Race and the Paris-Madrid contest, and duly stigmatising the want of sense of proportion which writers in the Press have suffered from in dealing with the accidents in the latter race, he proposes to limit the cubic capacity of cylinders, and that there should be a minimum weight of car instead of a maximum weight as at present. Mr. S. F. Edge has also written to us advocating the same proposals, and suggesting that an International Committee should meet to deal authoritatively with the subject, either shortly before or shortly after the holding of the Gordon-Bennett Race. Mr. Edge very rightly remarks that if everyone was mounted on a car which could only attain a maximum speed of 35 or 40 miles an hour, it would be just as interesting, in fact, racing would be more interesting, as the personal element would come in to a large extent, and also the condition in which the car was kept.

Mr. Scott Montagu's proposal to impose a minimum weight is, of course, designed to prevent frames being built dangerously light, by doing which the makers would be able to increase their speed, but at the risk of accident, and at the cost of producing vehicles which might perhaps get through a single race, but which would be dangerous or useless for ordinary touring requirements.

Considering this question, last week we pointed out that "such a proposal only applied, of course, to petrol cars with change-speed gearing. Special provisions would have to be adopted in the case of steam vehicles, and of any petrol cars which may in the future dispense with any change-speed gearing" It may be worth while considering whether regulations could not be adopted which would enable other classes of vehicles to be brought into line with these petrol cars, and so form the basis of a universally applicable system of rules.

It is not at first sight easy to see how this can be done. If a petrol car is to run without change-speed gearing it must have a reserve of engine power. An example of this is provided by the C.G.V. 8-cylinder engine, which ran without change-speed gearing and could take a steep hill without it. Of course it does this by using the full power of its eight cylinders on a steep hill, but employing only a small proportion of it on the flat. The reserve engine power in fact represents gearing, and it would obviously be unfair to estimate the full capacity of its cylinders, and then institute a comparison between it and cars of smaller cylinder capacity with three or four changes of speed.

Let us put the case in this way. Supposing the 8-cylinder car, with all its eight cylinders working at full power were going up a certain hill, and another car with only two cylinders, each of the same displacement as those of the C.G.V. car, were ascending the same hill on its lowest gear. Assuming the driving wheels of both vehicles to be of the same diameter, the gear down from engine to road wheels is in the one case four times what it is in the other, but conversely with the larger engine the useful cylinder displacement is four times that which it is on the car with the smaller engine and the lower gear. This suggests that gear ratio can be set off against cylinder capacity, particularly since the maximum speed of the car in both cases depends upon the speed at which the engine can run and on the top gear ratio—it is the maximum car-speed which it is necessary to limit, whilst the premium which is thus put on elimination of change-speed-gearing is perfectly legitimate. It might be done in this way:—Take the cylinder capacity as the denominator of a fraction and the gear ratio given by the lowest speed of the car (with change-speed gear) as divisor of the fraction, and if the results come out approximately equal, the cars are vehicles which may be raced against one another. Suppose in the case of the two cars we have been considering the piston displacement is 100 cubic inches per cylinder. Then applying our formula to the case of the two cars we get for the 2-cylinder car $\frac{2 \times 100}{\frac{1}{4}} = 800$. In the case of the 8-cylinder car we get $\frac{8 \times 100}{1} = 800$. The adoption of some such formula as this would enable cars to be compared with one another and put into categories in which, whether they use many gears or few, or only one gear down from motor to driving wheels, it will be fair to race them against one another. Of course, our readers will understand that even in the case of the so-called gearless car there is a gear down to the road wheels, so that the ratio we have taken in the case of the change-speed gear car is the ratio of gear on the lowest speed of that car to the fixed gear in the 8-cylinder car, and it is, of course, assumed that the driving-wheels are of the same diameter in each case. If there are differences in this respect they will have to be allowed for, and perhaps the simplest way to do this is to reckon the diameter of the driving-wheels into the gear ratio, and so practically take miles per hour with the engine running at a certain speed.

In the case of steam cars it might at first be thought that the same formulæ could be applied as in the case of the gearless petrol car, but this is not the case, as the real source of power is the boiler, and what is wanted is a comparison of boiler heating surface, first of all between different steam cars, and secondly, between steam and petrol cars. It is the heating surface of the boiler that really corresponds thermodynamically to the working portion of the cylinder in explosion engines. There does not appear to be any inherent reason why a formula should not be got out by which the heating surface of boilers could be compared with the cubic content of the cylinders of explosion engines, so that we could say that a steam car with a boiler of so and so many square feet of heating surface is the equivalent of a petrol car with cylinders of so and so many cubic inches displacement. This being accomplished, the formula we have established above for the comparison of petrol cars with one another will, it is plain, be applicable to the case of steam cars also.

If this is satisfactorily done, all the practical racing vehicles will be brought into line and the groundwork laid for organising more interesting, more scientific, more generally useful, and far less dangerous races in the future.

We have not taken the electric vehicle into consideration. At present it has no chance whatever, as far as can be judged, in a long-distance race. Of course the object aimed at by such regulations is to limit maximum speed—putting a premium on average speed. It is just by the introduction of detail improvements that with the maximum speed limit higher relative average speed will be obtained.

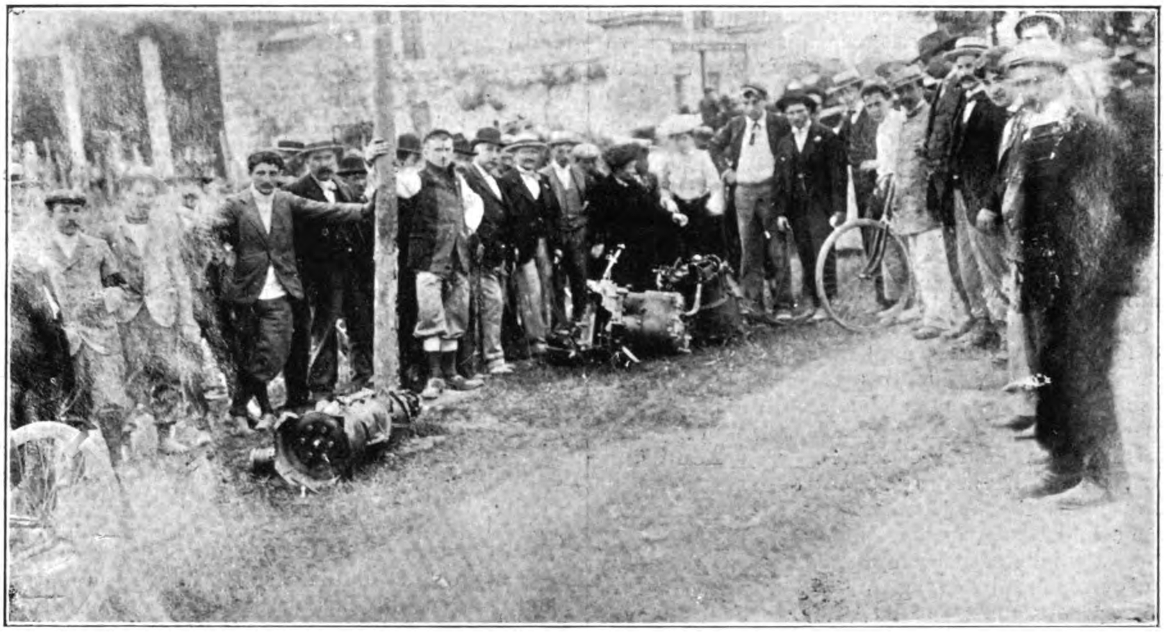
THE SPREAD OF EDUCATION.

THAT the letters of "Rusticus" and his supporters appearing in the *Daily Telegraph* were calculated to inflame the passions of the mob is only too apparent. On the other side of the Atlantic a similar spirit prevails, and, owing doubtless to the phenomenal spread of education in the United States, is infecting even the animal creation. Several automobilists recently in the neighbourhood of New York were quite peacefully driving a motor car along the high road, evidently not by any means at full speed. Passing through Milburn two prize bulldogs issued from a yard and pursued the automobile. One of them jumped on the back of the vehicle and was beaten off with a spanner, whereupon the driver put on his best pace with a view to distancing the dogs. The automobile can hardly have been a racer, for the dogs were able to keep fairly close behind it, and at a level crossing, where a train was passing, the vehicle had to stop, the dogs overtook their quarry, and an infuriated battle began. Three of the men who were in the car not being embarrassed apparently with a superfluity of physical courage took to their heels, and left the driver and another man to the mercies of the dogs, which finally were beaten off by a gatekeeper with a revolver. But we recommend the incident to the notice of those who think that no responsibility attaches to the sort of diatribes they write against the automobile in the Press. Fortunately dogs, so far, on this side of the Atlantic have not been educated up to such a degree of motorphobia, but the dog days are coming, and if the correspondence in the *Daily Telegraph* continues till that period, in full blast as at present, who knows what may happen?

IT is only just, however, to record the fact that if the anti-motorist spirit has produced these results in America some motorists in this country also have had to defend themselves against a four-footed opponent. A rather serious encounter between a bear and a motor car took place recently in the neighbourhood of Leicester. A gentleman who was driving an automobile from Bedford to Derby came round a corner and suddenly found a large bear on his hind legs executing a dance, and surrounded by an admiring throng. The driver slowed up as much as he could, but collided sufficiently with the bear to roll him into a ditch. This was too much for the feelings of Bruin, and he commenced an attack on the occupants of the car, but was fortunately prevented by his owner from doing any damage. It must be admitted, however, that in this case the bear had some provocation, and it is not necessary to attribute his action to the same cause as influenced the American.

WE think we may hail Sir Ralph Payne-Gallwey as a friend in disguise. There is nothing so calculated to abate fanaticism and unreasoning hostility as suitably burlesqueing its manifestations, and this is evidently what Sir Ralph Payne-Gallwey intends. He puts forward with apparent seriousness (but obviously with a wink of the eye) the suggestion that persons who are aggrieved by motor cars which refuse to stop when called on to do so, after upsetting pedestrians on the road, should be legally empowered to snipe them with buckshot. Sir Ralph is a humane man, however, and thinks it would not be fair to use anything larger in the way of shot than No. 8 or No. 9. Cartridges with shot of this calibre he proposes should be made up into cartridges labelled "motor cartridges," and served out to the police, who would supply them on demand to anti-motorists. Choke bore guns are barred, as Sir Ralph only desires to mark the motorists for identification at the next place at which they may stop, and not to seriously injure them. It is quite possible that some of the anti-motor fanatics may write supporting Sir Ralph's proposal seriously. It would be amusing if they do so, and will probably produce a reaction in the automobilists' favour. This, no doubt, is what Sir Ralph desires.

THERE seems to be a limit to the sort of police evidence that the Leeds magistrates at any rate will accept. Mr. Henry Fenton, of Chidswell, Dewsbury, was charged at Leeds last week with the usual offence by Police-constable Dalton. This functionary judged the speed of the car to be 16 or 18 miles an hour, but the way he arrived at his conclusion was by guessing seconds in his head and stepping out the distance with his feet. This was a little too approximate even for the magistrates, and they dismissed the case. By way of contrast, it may be mentioned that in a very similar case at Farnham, in which the Bench said (amid laughter) that they "were not absolute fools," the defendant was fined £5.

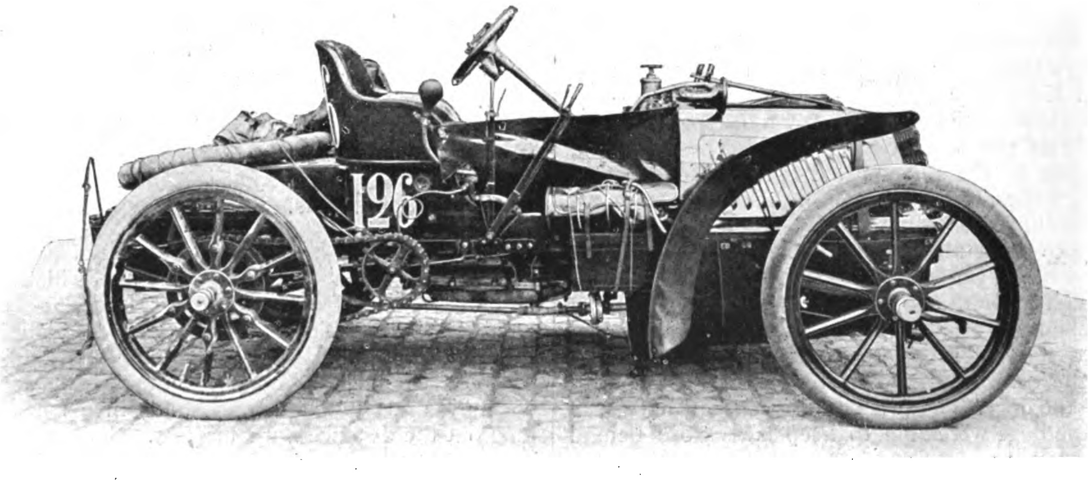


Paris-Madrid. The scene of the accident to Mr. Loraine Barrow's 45-h.p. De Dietrich car near Libourne. The motor and other parts of the machinery parted from the car and were projected a distance of 10 metres, as shown in our photograph.

ECHOES OF PARIS-MADRID.

A SUBSCRIPTION list has been started, with 200 francs, by *L'Auto* for the purpose of erecting a monument to Marcel Renault at the spot where he met his death. Amongst those who have subscribed are Baron de Caters. MM. H. Fournier, Lambergack, Tampier, Pierre Lafitte, Leon Serpollet. A subscription has also been opened for the mechanicians who were injured in the race. It has been suggested that the names of the mechanicians who met with their death during the run should be inscribed on the foot of the monument to be erected to the memory of Marcel Renault. At the funeral of the unfortunate motorist an enormous concourse of sympathisers assembled.

MADAME DU GAST's time on the road was nominally 10 hrs. 52 mins. $47\frac{2}{5}$ secs. But credit for a much better performance should be accorded to this remarkable lady, as she lost about three hours near Angouleme in affording assistance to Mr. Stead when he had his bad smash up. Curiously, Madame du Gast asserts she is no real lover of the automobile—rather the reverse—but regarding it purely from the view of a sportswoman, she glories in her experience. For years she has been noted



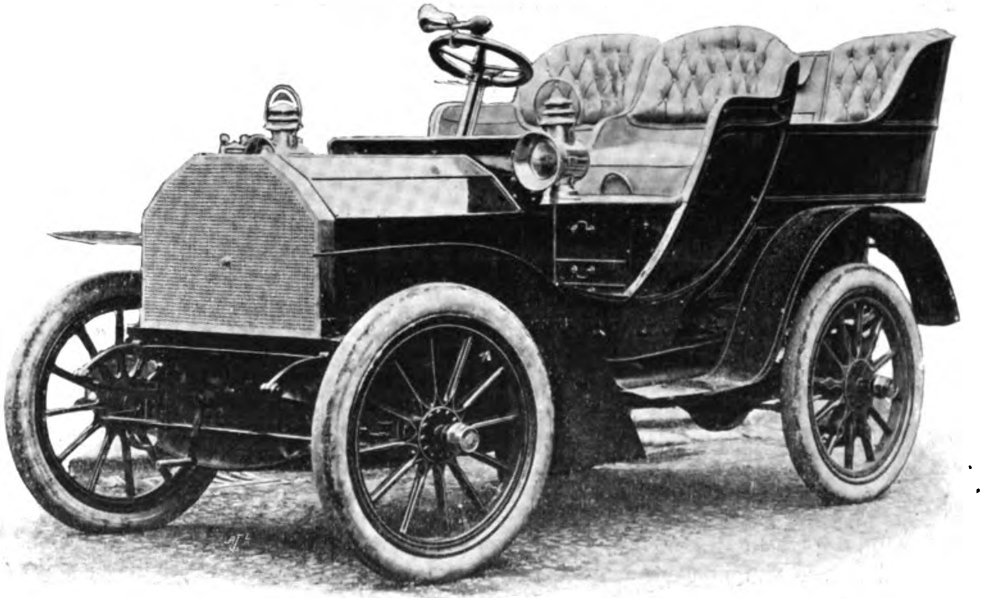
One of the Pipe Cars (No. 126) which made such a creditable performance in the Paris-Bordeaux Section of the Madrid Race, covering the distance in 8 hrs. 2 mins. $25\frac{2}{5}$ secs.

for excelling in nearly every form of sport in which skill, courage, and exceptional judgment are required. Moreover, Madame is exceeding wealthy. Little wonder, therefore, that she is popular, and was quite overwhelmed with floral offerings during her progress to Bordeaux and upon her arrival there.

Emile de Brou, who drove a 45-h.p. De Dietrich car (No. 85) in the race, upon the return journey to Paris examined some of the wrecks by the way. He located over forty cars in varying conditions of damage. The value of the smashed-up cars he estimates at a minimum of £70,000. He found both Mr. Loraine Barrow's and Mr. Stead's cars in a deplorable condition. The steel frame of the former was embedded 2 feet deep in the trunk of a tree. The tree will have to be cut down to release the remains of the vehicle. The 10-foot frame was telescoped down to 5 feet by the impact, and the motor was crushed almost flat. Mr. Stead's car was upside down on a large heap of stones, the steering wheel and post being buried in the stones, the wheels every now and again being rotated by the action of the wind.

The Spanish roads have been reported as far from bad by several of the tourists who covered the distance to the Spanish capital. In fact, considering in some places the long stretches of practically uninhabited districts, they are marvellously good. Mme. Lockert, the editor of our French automobile contemporary, *Le Chaffeur*, who drove a 12-h.p. Ader car (No. 20) over the full course, speaks in the highest terms of the roads. They were far better than many of the Paris-Vienna roads. Madame Lockert arrived at Madrid on the 27th, both the Baroness de Zuylen and Mme. Clarke having arrived the previous day. Altogether about 40 of the tourist cars completed the full course.

Madame Lockert on her 12-h.p. Ader car (No. 20) in which she drove in the Tourist Section from Paris to Madrid. The photograph was taken during a short rest between St. Sebastian and Vittoria, in Spain, and the splendid condition of the road in this district is very noticeable, corroborating the accounts which have been received from several quarters in this respect.

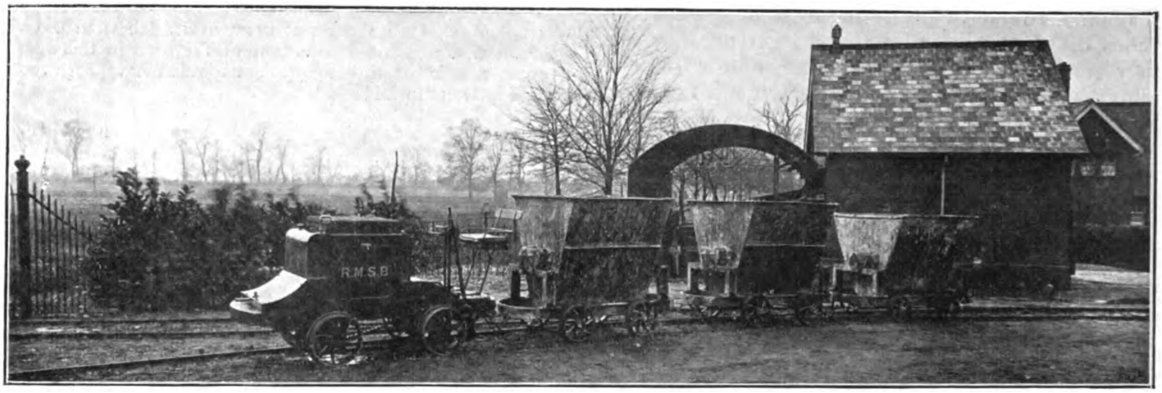


A 10-h.p. "Krupkar," fitted with tonneau body. This is a new make of petrol vehicle which derives its name from the well-known Krupp Company, of Essen, in Germany, who have taken up the construction of the engines and other parts of these vehicles. The cars are made in various sizes, ranging from 6-h.p. up to 24-h.p., and have either one, two, three, or four cylinders. The car shown above has a twin-cylinder motor which is provided with mechanical inlet-valves. The speed of the engine is automatically governed on the throttle. A honeycomb radiator forms the front of the bonnet. Three forward speeds and a reverse, which are operated by a single lever, are provided, and the power is transmitted from the gear-box to a live rear axle by a universally jointed propeller-shaft and bevel wheels in the usual way. The weight of the car is about 16 cwt., and it is well built throughout. The Company selling them in this country is known as Krupkar, Limited, and their general offices and showrooms are at Harrod's Stores, Trevor Square, Brompton Road, W.

THE BLAKE PETROL ENGINES.

Although the development of the petrol motor to its present high state of development is chiefly due to the automobile movement, yet there are many other purposes for which such engines are invaluable. Hitherto builders of motor cars have been so busy with the construction of complete cars that the demand for light high-speed engines for other purposes has been largely neglected. The difficulty of obtaining up-to-date engines of this kind, both for such purposes as we refer to, and by those builders of automotors who prefer to buy rather than make them for their cars, has, we are glad to say, been more widely recognised recently, and several firms, amongst whom we may mention Mr. F. C. Blake, are now practically restricting themselves to this special work.

The standard Blake motors have hitherto been made in three sizes, the nominal output of which is 3, 6, and 12-h.p. respectively, the normal speeds being 800 revs. per min., and the cylinders having a bore of 90 mm. and a stroke of 102 mm. A full description of them appeared in our issue of May 24th of last year. The 3-h.p. has a single cylinder, the 6-h.p. a twin cylinder, and the 12-h.p. has four cylinders.



The Blake Petrol-Locomotive at work at Richmond.

Mr. Blake has recently decided to manufacture standard engines of a larger size, and is now completing the first of his 40 to 50 nominal h.p. type, of which we give illustrations herewith. Like the smaller sizes, it is designed with a view to rendering it suitable for a variety of purposes, and can either be constructed throughout of iron for marine launch work, or can have the crank chamber cast in aluminium where weight is a consideration and the employment of this metal is permissible. In general design the same lines have been followed as in the smaller engines; the chief objects aimed at are simplicity of construction and cheapness of production. The large engine, however, is fitted with mechanically-operated inlet-valves, and there are other minor differences which will be gathered from the ensuing description. The first has been built for marine work, and is to be fitted as an auxiliary in a 53-ton schooner.

The general appearance of the engine is seen in Figs. 1 and 2, which are views from either side of it, and are reproductions from photographs taken by us before it was quite finished. Its approximate dimensions can be gathered from Fig. 2, in which a 2-foot steel rule is seen lying against it. Fig. 3 is a cross-section through one of the cylinders, and although not strictly accurate, because it is not made in the same plane through the engine, it shows the general disposition of the more vital parts, and serves to render clear the construction. In Fig. 4 certain of the more important parts are shown separately.

The cylinders are cast in pairs, and are provided with an unusually capacious water jacket around the heads and the valve chambers; an end view looking into the water-jacket is obtained in Fig. 4. The top of the jacket is formed by a large removable plate which is bolted down in place, and into which one of the water pipes of the circulation system is fitted. The inlet-valves on the one side, and the exhaust-valves on the other, are arranged in the usual manner, and are interchangeable; one of these valves, G, with its closing spring, G^1, and the guide, G^2, through which it fits, are seen separately in Fig. 4. The inlet-valve chambers in each casting are fitted with separate inspection covers which fit the openings, A^1, and are both held down by a single nut and a yoke piece. They both communicate with a single port, A, so that only one induction pipe for each pair of cylinders is required. The ignition plugs project horizontally into these chambers; they screw into the bosses, C, between the valves and the inspection covers. The exhaust-valve chambers are independent of one another, separate ports, B, leading from each of them. The valves are arranged further apart than are the inlet-valves, and the inspection covers above them, which fit into the opening, B^1 (Fig. 4), are each held down by a pair of nuts and a yoke. The cylinders have a bore of 135 mm. ($5\frac{5}{16}$ in.), and the stroke is 160 mm. ($6\frac{5}{16}$ in.); they are bolted down in the usual way, with a flat joint-face to the top of the crank-chamber.

The main body, D, of the crank-chamber is a single casting. It is open at each end and has two inspection doors on the one side. Separate chambers, D^4 and D^5, for the cams are provided in it, the cam-shafts passing through them. The ends of the crank-chamber are formed by separate castings, D^1 and D^2, the former being of such a shape that it not only forms a bearing for the crank-shaft, but also contains the spur wheels which drive the cam-shafts (see Fig. 4). The casting, D^2, closes the other end

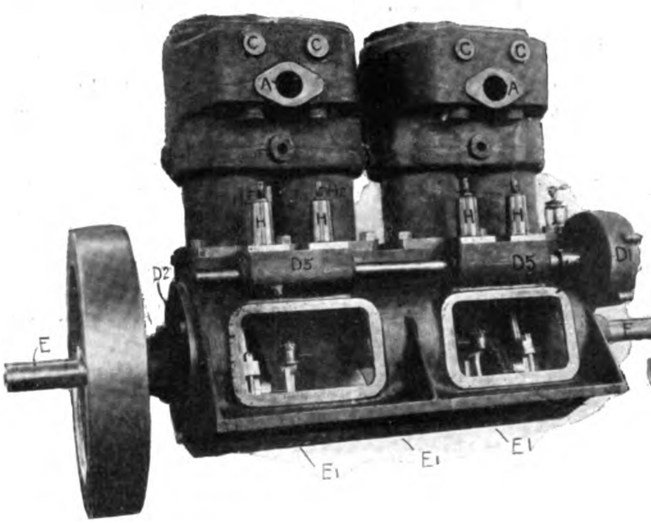


Fig. 1.—40-h.p. Blake Engine (unfinished). Inlet-Valve Side.

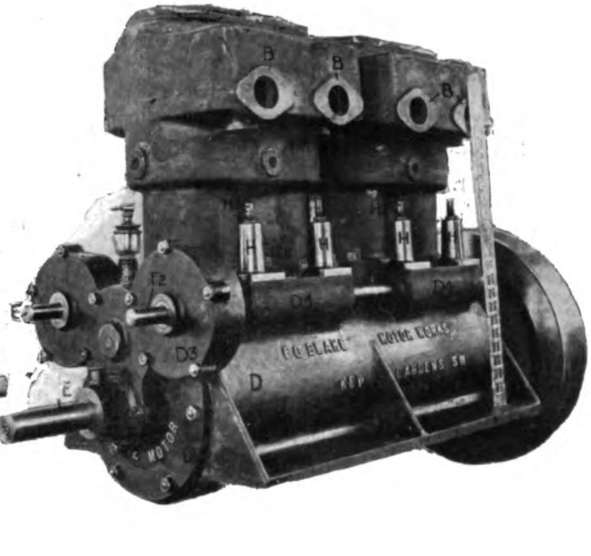


Fig. 2.—40-h.p. Blake Engine. Exhaust-Valve Side.

of the crank chamber and provides a long bearing for the crank-shaft, E; it takes the weight of the flywheel. Both end castings, D^1 and D^2, are turned so as to register in the machined openings at either end of the crank-chamber. Intermediate bearings are provided between each of the cranks. They are provided by brackets, E^2, which are secured by bolts, E^1 (Fig. 1), passing through the base of the main casting. These brackets, E^2, are seen in Fig. 3, where it will be noticed that the joint between them and the crank-chamber is formed on the arc of a circle struck from the centre of the crank-shaft; so that they also register accurately into line without difficulty; the machined surfaces on the crank-chamber which receive these bearings and those at each end are all bored out true at one setting in the machine tool.

The cam-chambers, D^4 and D^5, are open on their upper sides, and the guides, H, in which slide the push rods, H^1, are bolted down on this face. The rods, H^1, are fitted with small steel rollers for the cams to act upon, and are prevented from turning round in the guides by means of pins which are fitted into the guide castings, H, and lie in contact with a flat face formed on the one side of the push rod. The upper ends of the push rods have small adjustable steel rods, H^2, where they come into contact with the lower ends of the valve spindles, G, so that the amount of play between them and the valve spindles can be adjusted, and the necessary "set" given to the valves.

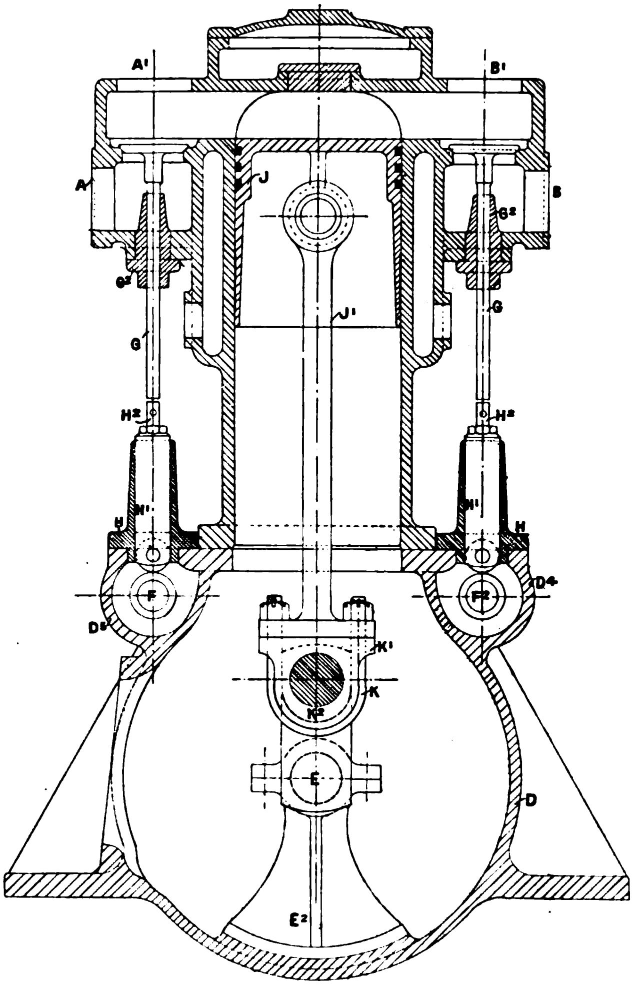


Fig. 3.—Cross section through Cylinder, Crank-Chamber and Valves.

The forward ends of the cam-shafts, where they pass through the casting, D^1, and through their gear wheels, are not in one piece with the main portion of the cam-shafts, and a sleeve coupling is employed for joining the two portions of each shaft together. The coupling sleeve is connected to the shafts by means of tapered pins passing through it and them; the couplings are provided in order that the casting, D^1, can be removed without disturbing the longer portions of the cam-shafts. The front portion of the inlet cam-shaft is marked F in our illustration, and that of the exhaust cam-shaft F^2. The spur-wheels, which are mounted upon them, mesh with the central wheel carried on the pin, F^3 (Fig. 4), and this wheel in turn meshes with the half size pinion on the crank-shaft. The casing containing the gear-wheels is rendered oil-tight by an outer cover, D^3 (Fig. 2), which is bolted to it and through which the crank-shaft and the cam-shafts project. These ends of the cam-shafts carry the commutator and the circulating pump respectively. The other end of one of them has a centrifugal governor mounted upon it.

The pistons, J, are of ordinary construction. The gudgeon-pin passing through them is hollow, and is split at its ends so that the set-screws which pass into it hold it in place by springing it outward where it fits through the piston. The connecting rod, J^1, which is of Mr. Blake's special design, and is of a similar construction to that previously used by him on the smaller engines, is clearly shown in Fig. 3. The brasses, K^1 and K^2, are held in place by means of the strap, K, which passes round a groove in the cap, K^2, and through holes in the lower brass, K^1, and in the head of the connecting rod; the "castle"-nuts, which draw the brasses up in place, are screwed on to the ends of the strap, K. The crank-shaft, E, is a steel forging.

The exhaust-pipe fitting, into which the gases from all four cylinders pass, is not shown in our illustrations, but for launch work is a water-jacketed chamber which is connected by short flanged pipes with all four cylinders. The exhaust gases are led from one end of it by a single pipe to the first exhaust box, and Mr. Blake usually provides a second box into which they are subsequently conducted before being allowed to escape noiselessly to the atmosphere. The circulating water is pumped through the jacket of this exhaust-gas expansion-chamber, and is led from it to the top of the cylinder jackets, being afterwards led out at the bottom by a pipe which takes it overboard. By this arrangement the exhaust pipe is kept comparatively cool, and the water itself is slightly warmed before it reaches the cylinder jackets.

The normal speed of this engine is 500 revs. per min., at which speed it is expected to give about 65-h.p. on the brake. Its weight (in iron) complete is about 8 cwt., and the weight of the flywheel is about 180 lbs.

At the time of our recent visit to Mr. Blake's works at Kew Gardens a large number of the smaller engines, and particularly of the 12-h.p. size, were passing through the shops, some of them for automobile work, others for launches, and a few for special purposes. Of engines for motor cars, a batch of about a dozen were nearing completion for Messrs. Pritchett and Gold, whose petrol cars, fitted with the Blake motor, were, it will be remembered, shown at the last Exhibitions at the Crystal Palace and at the Agricultural Hall. Not a few of this type have also been supplied and are in use for passenger service launches in different parts of the country, and this is interesting in consequence of the fact that they have then had to be passed by the Board of Trade. Just as in the automobile industry, so in launch work, the satisfactory running of petrol engines of the smaller sizes, ranging up to about 12-h.p., has been followed by a considerable demand for those of larger power, and it is for this reason that the larger engine which we have just described has been put upon the market. It will be followed, we understand, by one giving from 24 to 30-h.p., which will have mechanically-operated inlet valves, and will run at a normal speed of 750 revs.

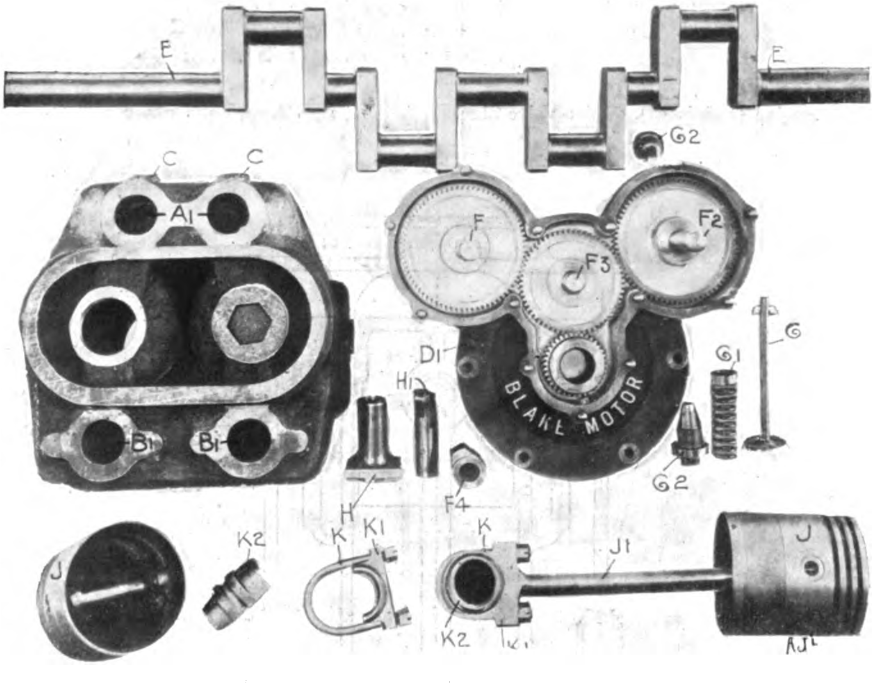


Fig. 4.—Parts of 40-h.p. Engine.—Crankshaft, Top of Cylinder Casting, Two-to-one Gear, Cam and Valve Gear, Piston and Connecting Rod.

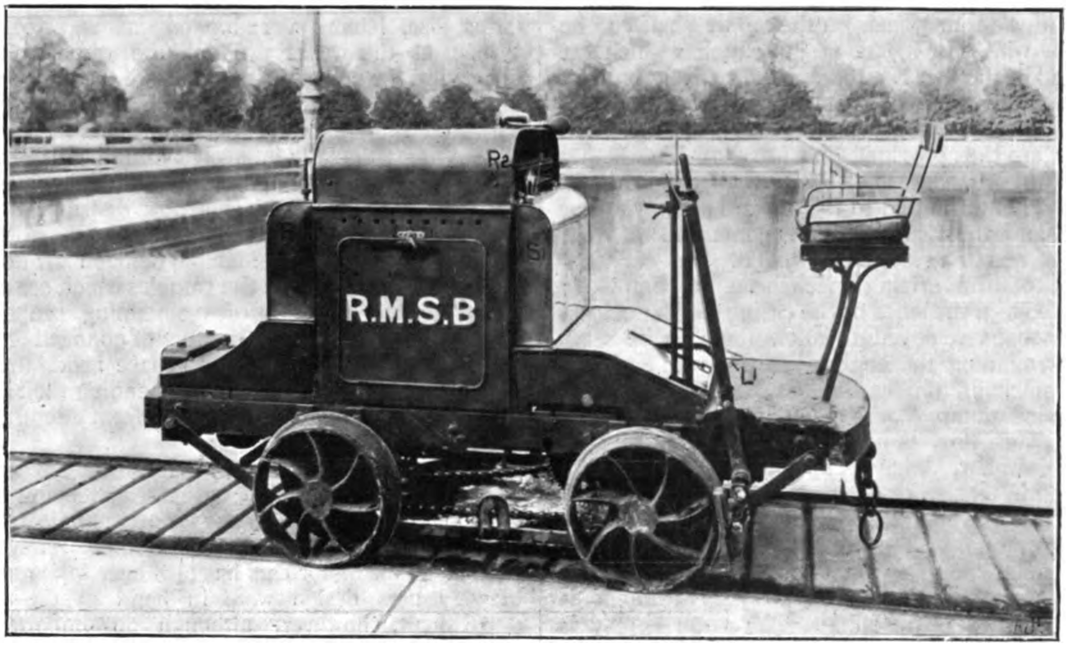


FIG. 5.—Blake Petrol Locomotive, supplied to the Richmond Main Sewerage Board.

per minute. Another noteworthy development showing the increasingly useful field for petrol engines is the application which has been made by Mr. Blake of one of his 6-h.p. motors to a small locomotive for the Richmond Main Sewerage Board. This diminutive locomotive is shown in Fig. 5, and a view of its chassis from above is given in Fig. 6. It is a compact and useful little tractor, and is used for drawing three or four of the special tip-trucks which are employed on the farm. It has been found capable of drawing a load of 4½ tons up a gradient of 1 in 30, and under favourable circumstances will take as much as 10 tons on the level. It has been in use now for some little time, and regularly deals with about 240 tons a week, with a fuel consumption of from 6 to 8 gallons of petrol. The distance which it has to run is not great, but it has most effectually replaced two horses, and has proved itself to be a labour-saving investment as well.

The framework and the method of mounting it with horn-plates about the axles follows ordinary railway practice. The engine is fixed somewhat forward of the centre, with its shaft lying longitudinally and projecting forward to receive the starting handle. The main clutch, L, is fitted to the flywheel, and is of the internal cone type; it is normally held in engagement by a spring, and is withdrawn by means of a foot pedal, L^1. The power is transmitted from the clutch to the countershaft, M, by means of alternative bevel gear-wheels, there being two facing wheels which are normally free to revolve upon the countershaft, of course in opposite directions. Either of them can be brought into play by means of a two-way jaw clutch which is operated by the upper hand-lever, M^2, through a system of levers of which the rod, M^1, forms a part. The countershaft also carries two spur wheels, N and N^1, of unequal size, which are at all times in mesh with corresponding wheels on a second and lower countershaft,

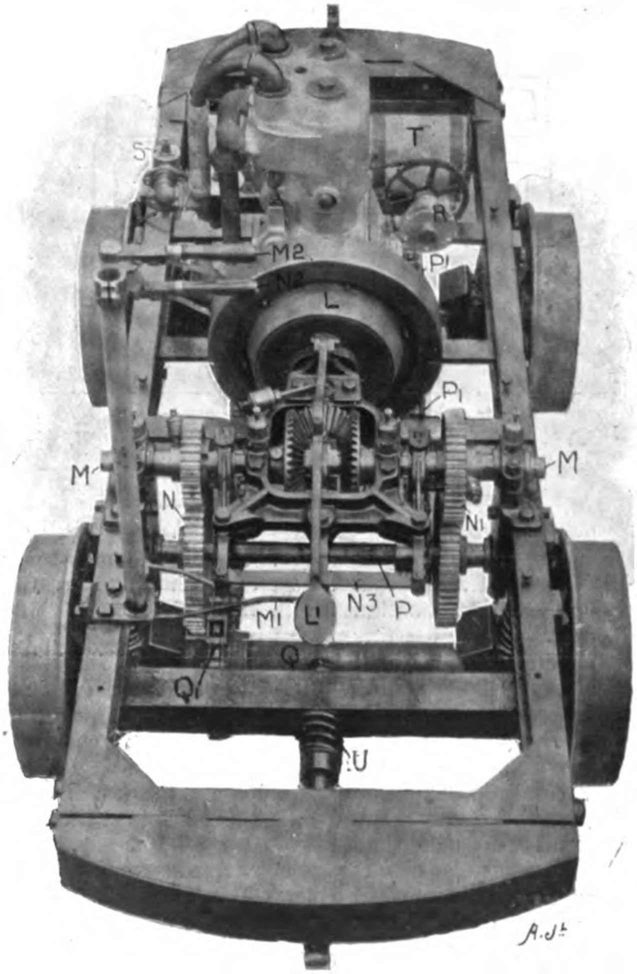
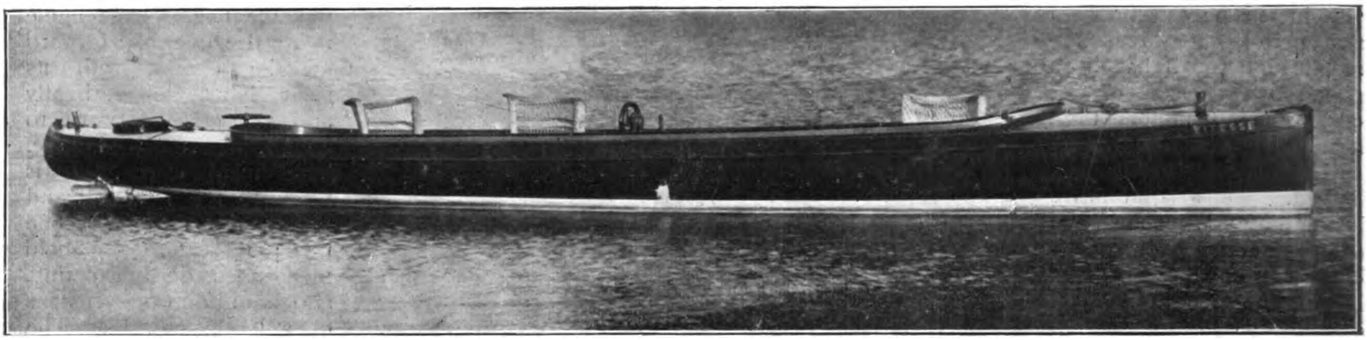


FIG. 6.—View of Driving Mechanism on Blake Petrol Locomotive.

P. Either of these spur wheels on the upper shaft can be rendered rigid with it by means of jaw-clutches which are inter-connected by the bar, N^3, and are alternatively brought into engagement by means of the lower hand-lever, N^2. Two different speeds, corresponding with five and seven miles an hour, are thus provided and are available whether travelling forward or backward. The power from the lower countershaft, P, is transmitted to the forward axle by means of a chain, P^1, and the rear axle, Q, is connected with the front axle by means of a second chain, Q^1.

The whole of the driving mechanism is completely enclosed. In Fig. 5, the sides of the casing which encloses the chains has been removed to allow them to be seen. The casing surrounding the engine is fitted with a hinged door at each side, and the carburettor, S, and the chain-driven circulating pump, R, are readily accessible through them. The exhaust box, T, lies across the machine near the front. A draw-bar, V, having springs arranged so that it can be used in tension or compression, is fitted behind. The driver's seat (of spider construction), at the rear, is seen in the illustration. A radiator, R^2, of the Blake type, is fixed horizontally above the engine, and is covered over in such a way that the air can pass through it when the locomotive is travelling. The water supply is carried in a tank, R^1, in front, and petrol in the tank, S^1, behind the engine. The Blake locomotive has been put upon the market at £250, when fitted with a 6-h.p., and a larger size, having a 12-h.p. engine, is priced at £340. Whilst at the works we took the opportunity of again inspecting the coil department where the Blake commutator and distributor, which was described by us on February 21st and March 7th last, is now also being manufactured. We were particularly interested to find that Mr. Blake has given up the construction of any but single coils for ignition purposes, now that with his new distributor one coil is alone required for multi-cylinder engines. Although there is doubtless still a considerable demand for double, triple, and quadruple coils, yet the troubles which are apt to occur, owing to the difficulty of maintaining proper insulation with them because of the number of connecting wires which have to be led from place to place inside them, are considerable, and the responsibility attending their manufacture is such as to deter most people from attempting it when not absolutely necessary.

A glance into the tinsmith department, before leaving, showed that considerable business was being done in the manufacture of special tanks for automobile and other purposes, and of radiators of various kinds. The manufacture of bonnets for motor cars has also been taken up, and some of very neat design were in hand at the time. This department, however, although an important one, is of more interest to manufacturers than to our general readers, and we need not, therefore, refer to it at any length.



12-h.p. Blake Launch "Vitesse." Length 34 ft. 6 ins., Beam 4 ft. 6 ins. Weight of Machinery 400 lbs., Displacement about 18 cwt., Maximum speed 13½ m.p.h.

Beware!!—Police traps are on the increase all round the country, some of them casual, others, comparatively speaking, permanent. For the benefit of our readers we mention a few of those which have been sprung this week. Starting from the bridge between Southampton and Totton Police Station is a measured piece of road; also a telephone trap between Totton and Lyndhurst, a measured mile on the main road from London to Southampton, on the principal part of the Southampton Avenue. In the same district there is another trap at Kingsworthy, and Southampton itself is at the moment quite a hot-bed of police stratagem. The Winchester Bench are particularly severe on all motorists brought before them. In the Leeds district victims to the police tactics are retaliating by painting in several directions in 12-inch letters warnings of "Motor Trap." The following elaborately-arranged traps must be watched for near Malton and York. One at Four Alls public house, six miles from York. Also one between the 7th, 8th and 9th milestones at Barton Hill, and 1½ miles past Old Malton Cross Lane, 400 yards after the school with the clock tower. It is only fair to state that due notice is given locally by red-lettered placards stating that full penalties will be inflicted for excessive speed. The Sunday pastime of some of the Essex police between Takeley and Dunmow is bagging motorists. One ingeniously laid trap is just past the inn on the Bishops Stortford Road, where the Great Eastern Takeley Station Road comes in to the main road, the start of the measured mile being just past the pillar letter box on the left.

A PETITION to the House of Commons has been presented on behalf of a number of users of electric vehicles, "praying" that electric automobiles may be excluded from the numbering regulations which it is proposed to introduce into the Government Bill for identifying automobiles in the future.

AN AMERICAN PETROL LURRY WITH A VARIABLE SPEED GEAR.

THE need for some variable speed mechanism, in which the gear ratio between the engine and the road wheels can be changed gradually, is probably felt more acutely in connection with petrol lurries or vehicles which have to carry heavy loads at a comparatively low speed, than with any other form of automobile. The reason for this is, of course, obvious, for with lurries carrying a heavy load the inertia at starting is considerable, and, with the ordinary forms of change-speed-gear, the unskilled driver is liable to do a considerable amount of damage, both when changing from one speed to another, and more especially when starting from rest. With a variable speed mechanism, however, provided that it has a full range from zero, a start can be made quite gradually, and consequently the sudden jerks which are so injurious to the transmission mechanism can be eliminated; the changes from one speed to another being also gradual, the same immunity from injurious strains would be obtained at such times. Although the difficulties of designing such a gear are enormous, and have baffled numerous inventors, a large number of engineers are still wrestling with the problem, and from time to time a new form of mechanism, or a modified one, makes its appearance. One of the most favoured systems for obtaining the desired result is that in which one-way clutches are employed for giving an intermittent ratchet motion to the driving shaft, the extent to which that shaft is rotated by each impulse from the driving shaft being variable. One such gear as this has already been put on the market, and applied to lurry work, by Rudolph Hagen and Co., of Cologne; it has already been referred to by us. The machine we are about to describe operates upon a similar principle, but the details of construction are different in several respects. It has been developed by the Union Motor Truck Company, of Philadelphia, and was shown by them at a recent Automobile Exhibition in New York.

The finished vehicle is shown in Fig. 1, where it will be noticed that the driving mechanism is mounted upon an underframe, connecting the front and rear axles, and that the load-carrying platform and the driver's seat, which are of light construction, are suspended independently above it. The power is generated by a four-cylinder horizontal petrol motor, which develops about 20 horse power at 400 revolutions per minute. The cylinders have a bore of 5 inches and a stroke of 6½ inches. The engine is placed centrally, and the power is transmitted direct through the gearing to the shell of a differential gear fitted to the live-rear-axle.

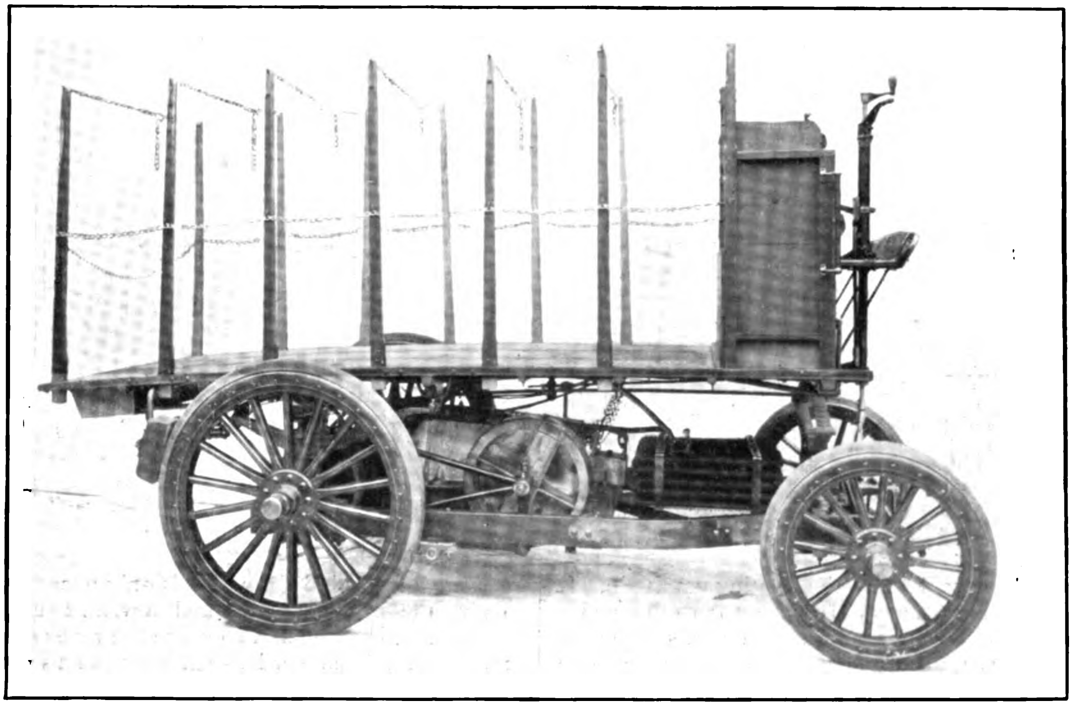
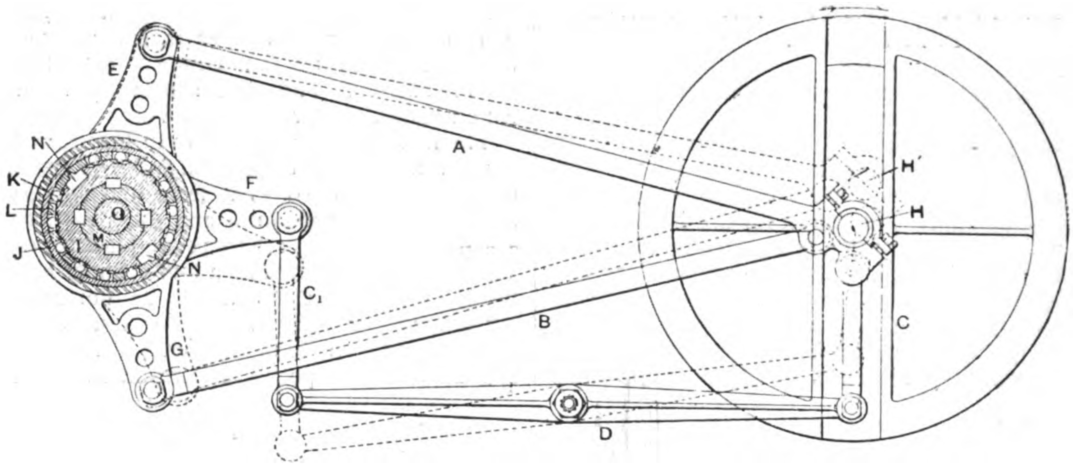


FIG. 1.—Petrol Lurry fitted with gradually-variable change-speed gear.

The transmission mechanism will be understood by reference to Figs. 2, 3, and 4—in which H is a crank-pin which can be moved radially on the flywheel of the engine, and O is the live-rear-axle, to which the power is transmitted by means of the three connecting rods, A, B, and C. The three connecting rods are all connected at their one ends with the crank-pin, H, and when it is moved outwardly from the centre of the crank-shaft, they are given a reciprocating motion by it as the shaft revolves. The rods, A and B, pass direct to arms, E and G (Fig. 2), which form part of the drums marked with similar letters in Fig. 3. The connecting rod, C, passes to one end of the intermediate pivoted lever, D, the other end of which is connected by the rod, C', with the arm, F (Fig. 2) of the drum, F (Fig. 3). The three drums, E, F, and G, lie alongside one another and are mounted so as to be free to oscillate independently of each other. By the arrangement of rods it will be seen that the



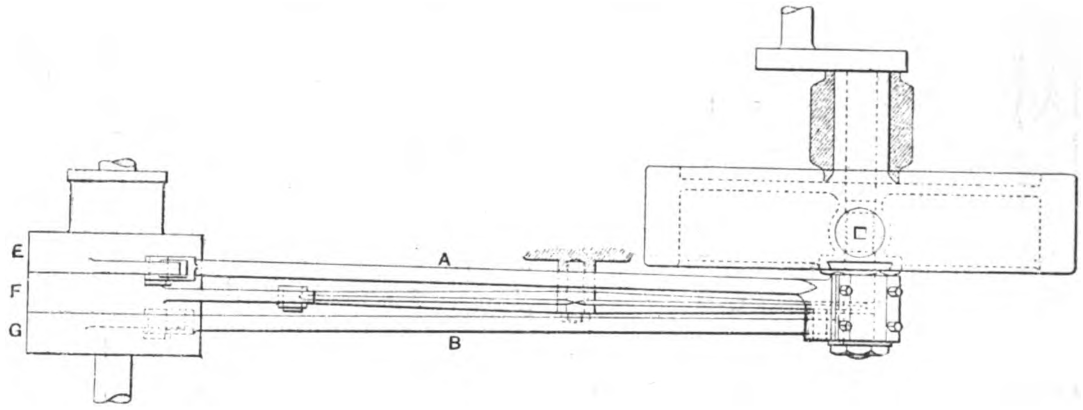


Fig. 2.—Diagrammatic side view of variable-speed gear.

Fig. 3.—Plan of same.

drums are caused to oscillate by the rotating crank-pin, H, when it is in a position (such as H¹) eccentric to the crank-shaft, but that when it is concentric with that shaft (as at H), no movement is transmitted to them. It will also be noticed that the connecting rods are arranged in such a way that the drums, E, F, and G, oscillate in either direction at different periods during any one revolution of the crank-shaft.

The drums, E, F, and G, are each fitted internally with hardened steel rings, J, which are rigidly secured to them, and these rings form the outside members of independent roller clutches. The rollers, K, which are made of hardened tool steel and are ⅝-in. in diameter, are carried in a cage, L, and are held by it between the ring, J, and the steel centrepiece, I, this latter being keyed to a sleeve, M, which is connected with the shell of the differential. The outer surface of the portion, I, is so shaped as to form a free-wheel clutch either for a right-hand or for a left-hand direction of rotation, according to the position of the rollers, K, about it. The grooves in it are, for this purpose, of double the usual width, and are similarly shaped both ways. The cage, L, can be made to restrict the free play of the rollers in whichever direction may be required, and to so cause a resulting forward or a backward motion to be imparted to the road wheels. For this purpose the cage, L, is connected with the central portion, I, of the clutch by means of the keys, N, and these keys are of a spiral form. It is only necessary, therefore, to give the keys a longitudinal movement in order to turn the cage, L, slightly, and so cause the roller clutches to act either right-handedly or left-handedly. This constitutes the reversing gear.

The means adopted for moving the crank-pin, H, radially in the flywheel, is seen in Fig 4. The pin is fixed securely to a hydraulic piston, P, which fits into a cylinder, Q, formed in the flywheel itself. The piston is normally held in the position shown, in which the crank-pin, H, is concentric with the crank-shaft, U, by means of a strong compression spring, R. It is moved against the action of the spring by means of oil, which is pumped into the back end, S, of the cylinder, Q, through the passage, T, and a hole through the whole length of the crank-shaft. The other end of the crank-shaft terminates in a stuffing box, and the necessary oil under pressure is forced by a small pump, which is driven by the engine through gearing. The pump itself can be brought into engagement with the engine, or disconnected from it by the driver; normally, it is disengaged.

For starting the car the oil-pump is brought into engagement with the engine, and the crank-pin, H, is consequently caused to move slowly outward from the centre of the flywheel. A gradual start is thus made, and the speed will continue to increase (until the maximum is reached), unless the driver disconnects the pump. By so doing, however the crank-pin will remain in whatever position it may be at the moment, for the oil is unable to find its way back to the pump, and consequently the pressure behind the piston, P, is maintained. When it is desired to stop the car the driver opens a small valve, which allows the oil to escape, and thus he can allow the crank-pin, H, to return either slowly or quickly to or towards its concentric position.

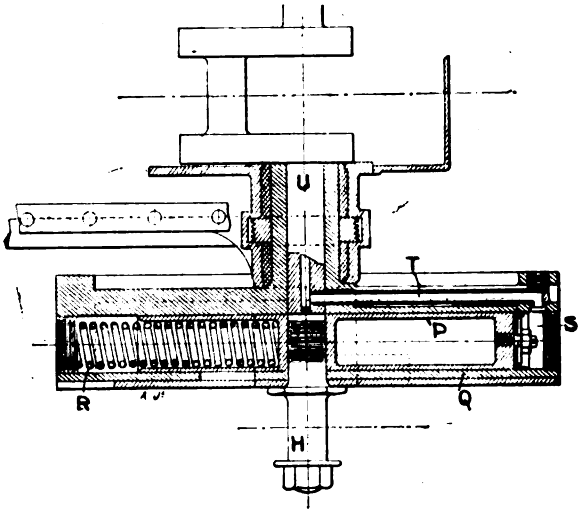


FIG. 4.—Section through crank-pin, and hydraulic cylinder in flywheel.

THE OSTERGREN 2-CYLINDER KEROSENE ENGINE.

THE Ostergren engine, like the Diesel engine, which it closely resembles, is chiefly interesting to automobile engineers in consequence of the fact that it employs kerosene as a fuel, and that the efficiency obtained by the system adopted is extraordinarily high. Curiously enough, the Diesel engine does not—in this country at any rate—appear to have met with the success which was anticipated for it, although we have heard from time to time of its use in America and on the Continent. The results obtained from tests which were made with it some little time ago have undoubtedly afforded valuable data for those studying the problem of internal combustion engines, and for this reason we gave very full descriptions, both of the 4-cycle and of the 2-cycle forms in which it was made. (*See* page 584, Vol. III., page 593, Vol. IV., and pages 65 and 306, Vol. V.)

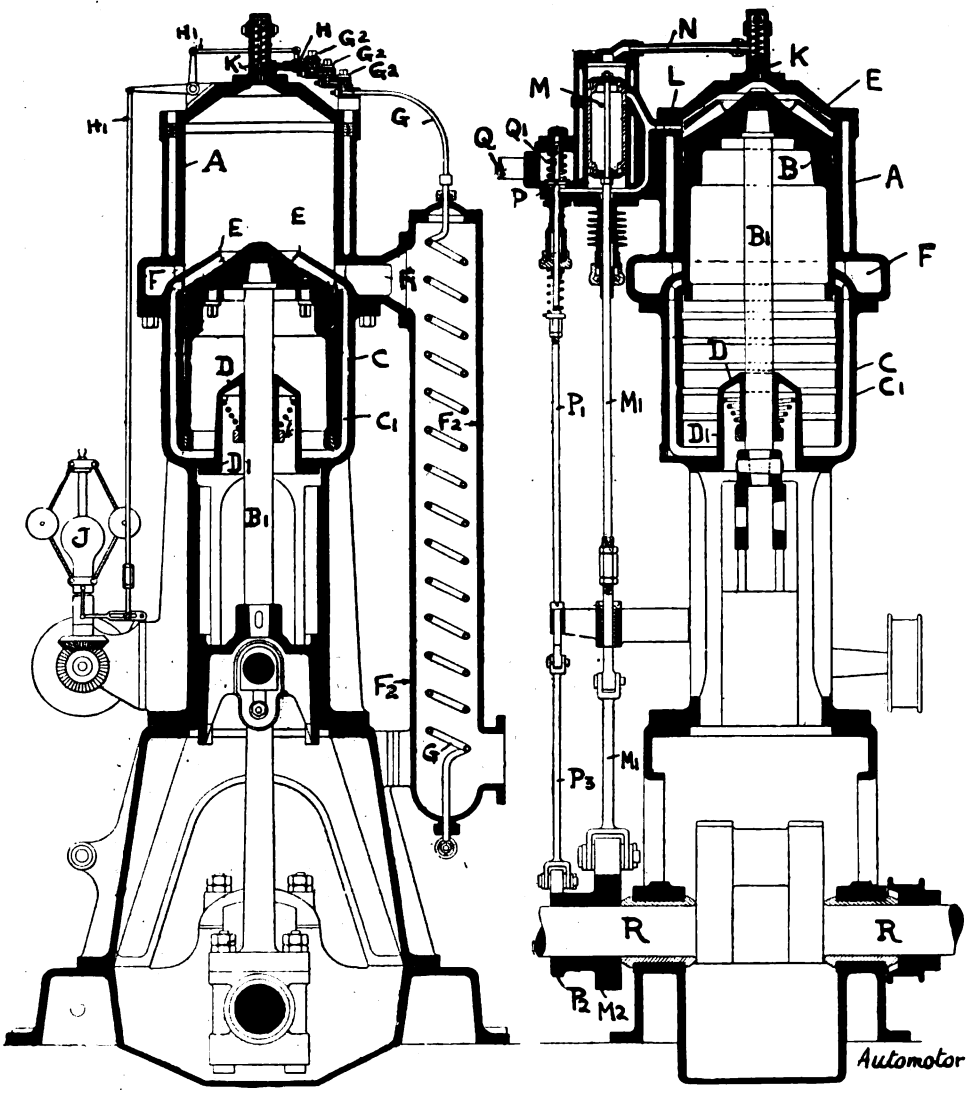
The Ostergren engine hails from America, and although its design is, as we have said, very similar to that of the Diesel, yet it has certain interesting and novel features, even if it does not appear to show any marked advantages over its earlier rival. Just as was the case with the Diesel, claims are now made that the Ostergren engine, although essentially a stationary machine in its present form, can be modified so as to suit automobile requirements. We are, however, still sceptical on this point, for it is certain that something more than mere modification is necessary before it can be satisfactorily employed for such a purpose.

The chief features common to the Ostergren and the Diesel engines are, that air alone is present in the working cylinder during the compression stroke, and that the compression is carried up to such a high degree prior to the injection of the fuel that spontaneous ignition then occurs, and a comparatively slow combustion ensues. A comparison between the new engine and the Diesel two-stroke pattern shows a further similarity of arrangement, for the fuel is injected by compressed air, and the necessary pressure is obtained in two stages. The chief differences in the two machines are, that Mr. Ostergren uses the under-side of the working pistons for compressing the air initially, that he has tried to improve the scavenging action of the entering charge of air to the working cylinder, that a hit-and-miss governing action is employed, that the piston of the air compressor proper is put, to a certain extent, in equilibrium whilst at work, and that the pressure in the reservoir used for starting the engine is automatically maintained by the combustion in the working cylinder.

The construction and principles on which the Ostergren engine works will be seen from the accompanying illustrations. Figs. 1 and 2 are vertical sections at right-angles to one another; the former shows the engine when the piston is at the end of its working stroke, and Fig. 2 shows it when the piston is at the end of its compression stroke. In the latter illustration, the fuel is on the point of being injected into the cylinder and the working stroke is about to commence.

The cylinder is made in two pieces, A and C, which are bolted together, the former being water-jacketed and the latter being provided with ports, C^1, through its walls, which pass from end to end of it. The piston, B, travels from near the top of the upper portion down to the bottom of the lower portion, and in so doing it compresses the air which is contained in the cylinder beneath it. The lower end of the cylinder is normally closed by the valve, D, which is held down upon its seat by a spring, this seat being formed by a flanged sleeve, D^1, closing the bottom of the cylinder. The piston rod, B^1, passes through the centre of the valve, D, and is turned to fit it as closely as possible. The upper portion of the cylinder is provided with a central inlet valve, K, in its head for the injection of the fuel. A small auxiliary air-compressing cylinder communicates with it through the ports, L, its hollow piston, M, being operated by the cam, M^2, on the crank-shaft, R. The cam, M^2, which is shown separately in Fig. 3, is so shaped that it not only lifts the piston, M, by means of the connecting rod, M^1, but also draws it down again by means of small levers, M^3, and the connecting tie rod, M^4. The port, L, it will be observed, is branched so as to allow the compressed air or gases in the working end of the cylinder to enter, at times, both above and below the piston, M, of the auxiliary air compressor.

The piston is fitted with an annular deflector, E, secured to it by webs, so as to leave passages between the deflector and the piston-head. Exhaust ports are arranged in the lower part of the cylinder-casting, A, and these lead into an annular space, F, which communicates with the vaporising chamber, F^2, through the pipe, F^1. The piston discloses the ports, FF, at the end of its working stroke. The valve, P, the rods, P^1 and P^3, and the cam, P^2, which operates them, form part of the self-starting mechanism of the engine, the operation of which will be explained later. In Fig. 4 are shown the system of levers by which the self-starting valve, P, is operated. The rod, P^3, is shown in the position in which it is adapted to be raised by the cam, P^2, mounted as shown on the end of the crank shaft, R. The rod, P^3, when in this position, periodically lifts the valve P,



THE OSTERGREN TWO-CYCLE KEROSENE ENGINE.

FIG. 1.—Section through Cylinder and Exhaust-Chamber. The Piston at the end of Down-stroke.

FIG. 2.—Section through Cylinder and Air-Compressor. The Piston at the end of Up-stroke.

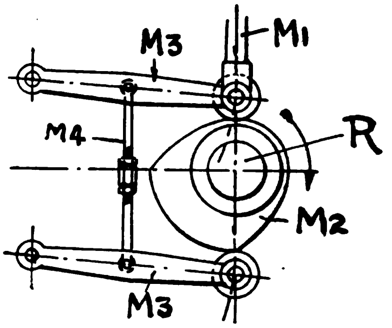


FIG. 3.—The Air-Compressor Cam.

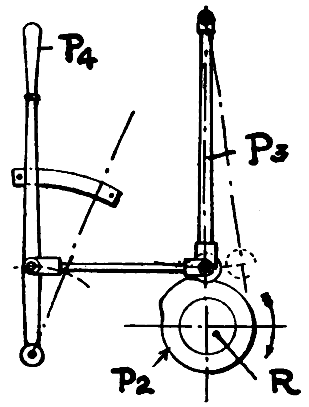


FIG. 4.—The Self-Starter Lever and Cam

A, water-jacketed working cylinder.
B, piston.
B^1, piston rod.
C, air-compressing portion of cylinder.
C^1, air passages in wall of ditto.
D, air induction valve.
D^1, sleeve forming seating for ditto.
E, annular deflector.
F, annular exhaust passage.
F^1, exhaust pipe.
F^2, exhaust chamber.
G, oil vaporiser.
G^2, check valves.
H, shut-off valve in fuel feed.
H^1, system of levers connecting H with governor, J.
J. governor.
K, oil inlet-valve.
L, port leading from working cylinder to high-pressure air-pump cylinder.
M, piston of high-pressure air-pump cylinder.
M^1, rod operating piston, M.
M^2, cam operating ditto.
M^3, levers carrying rollers above and below cam, M^2.
M^4, link connecting levers, M^3, together.
N, air pipe from compressor cylinder to valve, K
P, mechanically controlled starting valve.
P^1, rod operating valve, P.
P^2, cam operating ditto.
P^3, swinging rod, carrying roller.
P^4, hand-lever bringing P^3 into operation.
Q, pipe leading to compressed-air reservoir.
Q^1, spring holding valve, P, down on seat.
R, crank-shaft.

off its seat by means of the intermediate vertical rod, P^1. The rod, P^3, is brought into the position shown, by means of the hand-lever, P^4, which moves over a quadrant guide. When the engine is running normally, and the self-starting mechanism is not in use, the handle, P^4, and consequently the rod, P^3, are brought into the dotted line positions, and the rod, P^3, is then out of the sphere of operation of the cam, P^2.

The operation of the engine is as follows:—On the down stroke the piston, B, compresses the air that has previously entered below it through the inlet valve, D, and immediately after it has disclosed the exhaust ports, FF, the space between the annular baffle, E, and the head of the piston comes opposite the ports, CC, and the air compressed beneath the piston rushes through those ports up into the working cylinder and scavenges out the burnt gases, which pass out through the exhaust ports, FF, and down through the oil pre-heating chamber, F^2. On the return stroke the piston, B, first closes the ports, CC, then the exhaust ports, FF, and then commences to compress the air contained above it. While the air is being compressed above the piston, the working end of the cylinder is in communication through the port, L, with the spaces both above and below the auxiliary piston, M; this piston, which is then in a lower position than that shown in Fig. 2, is therefore in pneumatic equilibrium at this time. As the piston, B, approaches the extreme end of its compression stroke, the cam, M^2, proceeds to lift the auxiliary piston, M, into the position shown, by which means the already compressed air in the space above it is still further compressed. Finally, at the moment when the piston, B, is at its highest position and about to commence the working stroke, the auxiliary piston, M, is lifted by the full action of the cam right to the top of its cylinder, forcing the air through the pipe, N, at a pressure considerably exceeding that prevailing in the working cylinder, and consequently opening the inlet valve, K, above which a certain amount of kerosene has been introduced, and injecting the fuel into the cylinder.

As the oil enters through K it ignites spontaneously, as in the Diesel engine, owing to the high temperature of the compressed air in the main cylinder, and the combustion is comparatively slow and progressive.

At an early part of the working stroke the cam, M^2, acting upon the lower arm, M^3, draws down the auxiliary piston, M^1, from its highest position, and this action sucks kerosene through the pipe, G, the check valves, G^2, and the cock, H, into the valve chamber, K, where it remains ready for the next working stroke of the engine.

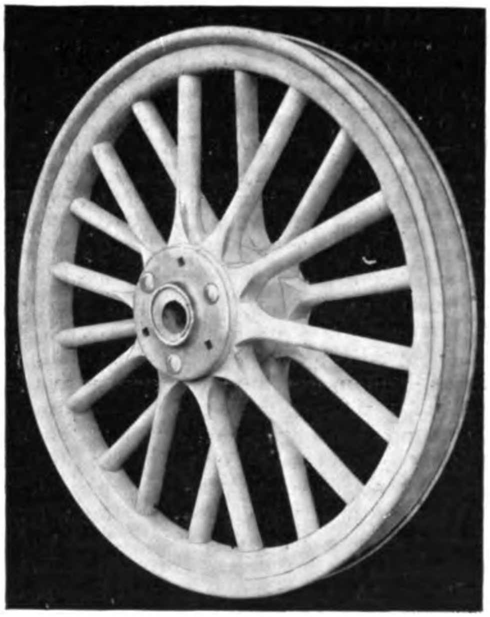
It will be observed that, as already stated, the branching port, L, communicates both with the spaces above and below the auxiliary piston, M. It will be observed also that the passage is continued underneath the valve, P. This valve is normally held down in its seat by the spring, Q^1, and communicates through the pipe, Q, with a high pressure reservoir. The valve stem of the valve, P, projects upwardly only, and is not continuous with the rod, P^1, although the latter rod is arranged so as to lift the valve. The valve is, therefore, free to rise when sufficient gaseous pressure is applied underneath it. When the working stroke of the cylinder of the engine commences the pressure prevailing inside the working cylinder is communicated through the port, L, to the lower face of the valve, P, which consequently lifts and a portion of the gases pass from the working cylinder through the valve and the pipe, Q, to the high pressure reservoir. This action continues, while the engine is first running, until the pressure in the high pressure reservoir becomes practically the same as that in the working cylinder at the moment of combustion.

When this point is reached, a sufficient pressure is stored in the reservoir to enable the engine to be automatically restarted by means of the hand lever, P^4 (Fig. 4). This lever, as already explained, brings the rod, P^3, into a vertical position above the axis of the crank-shaft, R. The cam, P^3, then lifts the rods, P^3 and P^1, opening the valve, P, against the pressure of the gases in the reservoir, which then pass through the port, L, the piston being at the time just over the dead centre, and so start the engine. When a sufficient number of revolutions have been thus obtained, the starting lever, P^4, is brought back to its original position and the engine operates normally. The system of governing employed is practically on the hit-and-miss principle. The cock, H, through which the oil enters in obedience to the suction exercised by the piston, M, is connected by a system of levers, H^1, with the governor, J. At a certain speed the governor closes the cock, H, and so no oil is allowed to enter K until the speed of the engine is again reduced.

The arrangement of the air inlet valve, D, appears to be a weak point in the design of the engine. Either a considerable amount of leakage must take place owing to looseness of fit between it and the piston rod, B^1, or if it is made sufficiently tight to act effectively as a stuffing-box, it would prevent the valve from acting properly.

THE MULLINER DOUBLE ARTILLERY WHEEL.

The accompanying illustration shows a patent wheel, which has been designed by the Mulliner Motor Body Company, of Accrington, to resist those side strains which are imposed by a car when driven at high speed round a corner, or by such obstacles in the road as tramway lines. For this purpose the spokes are arranged in two sets, and they are fixed so as not to be at right angles to the axle. The hub is wider than usual, and each set of spokes spring from one of its ends, although their outer extremities are only slightly staggered where they fit into the felloe. By this arrangement an extremely strong wheel results, because the spokes do not have to take any side strain at right angles to themselves, but do so by converting a component of the side strain into a direct down thrust. It is easily adapted to any axle, and is claimed to be both inexpensive and as light, or lighter, than the ordinary artillery wheel.



The first night balloon ascent, weather permitting, takes place to-day (Saturday) at the Ranelagh Club under the auspices of the Aero Club. Next Wednesday at 4.15 p.m. four balloons will ascend on the same grounds, also under the auspices of the club.

DEMONSTRATION AT HERTFORD.

On Thursday last week the demonstration of the controllability of automobiles carried out upon the invitation of Mr. C. Kenneth Murchison, the Mayor of Hertford, was a success from first to last. About 16 cars started from the Automobile Club in the morning, arriving at their destination about mid-day, when they were joined by half a dozen local automobilists, bringing the total up to 22. Fortunately the weather was fine, and the tests demonstrating the ease with which the cars could be controlled brought together a considerable crowd, who displayed the greatest interest in the whole of the proceedings. Amongst those who took part in the demonstration were the Hon. J. Scott Montagu, M.P., Captain Kenneth Campbell, D.S.O., Captain H. H. P. Deasy, Messrs. A. C. Blomfield, H. R. Beeton, T. B. Browne, C. Cordingley, F. L. Forge, Ernest Owers, G. Weller, Granville Kenyon, J. Rochford, Munn, Watt, W. Skip, J. M. Parker, Dennis, G. Wooldridge, W. J. Peall, Dr. Barnes, and two of the club secretaries, Mr. Basil Joy and Mr. Rees Jeffreys. A luncheon provided by the Mayor was partaken of at the Town Hall, invitations having been issued to the Borough and County Magistrates, the County Councillors, Members of Parliament for the county, and a number of other influential gentlemen, in addition to the proprietors of automobiles in the locality, and the members of the Automobile Club. Amongst those who had accepted the invitation were Mr. H. T. Hodgson (the High Sheriff), the Mayor of St. Albans, Col. H. Daniell (the Chief Constable), Rev. the Hon. Canon Lyttelton, the Rev. E. Killin Roberts, &c. After the luncheon, at which the Mayor presided, the toast of the "Progress and Welfare of Automobilism" was entrusted to Col. Daniell. He confessed he was ignorant of the technical details of motor cars, although he had had several delightful experiences on automobiles. The drive which he had had that morning was sufficient to convert the strongest opponent to automobilism to an equally strong opinion in its favour. He had, however, no reason to be converted, as he had never in his official capacity been hostile to automobilism, which, in his opinion, would not interfere with the use of the horse. He thought the strongest prejudice against automobilism was brought about by the reckless driving of a few. Cars should not be tolerated on the highway going at railway speed, and vehicles fitted with such enormously powered engines as those lately built for racing purposes should never be allowed on the King's highway in these islands. He excluded from these remarks the forthcoming Gordon-Bennett Cup Race, which was under different and proper conditions. He was glad to say the Herts County Council's progressiveness and desire for everything that was best was shown in the excellent condition of the Hertfordshire roads; in fact, he thought they were almost a temptation to rapid driving. Automobiles should come under the common law with the same rights and privileges as other users of the highways. As an alternative suggestion to numbering cars generally they might have a black list, and instead of numbering all cars the justices should have the power, in cases where they thought a fine was insufficient, to order the convicted driver to carry a distinct number for a certain period, thus announcing to all and everyone that the driver was a suspected character. Automobilism had established itself in England and had a great future before it. He hoped the time would come when it would be as rare to see a foreign-built automobile as it was to see a foreign-built horse-carriage in this country. The Automobile Club would have to check the reckless drivers' habits. If the Club was negligent or apathetic in its dealing in this matter, it would do more to stifle the progress of automobilism in England than even repressive legislation.

Mr. John Scott Montagu responded on behalf of the Club, and proposed the health of the Mayor.

The Mayor in replying welcomed the automobilists to Hertford, and said that Mr. Balfour, the Premier, had hoped to be present, but his duties in the House of Commons unfortunately kept him away. He was convinced that the demonstration that day in Hertford would be as useful to the industry as insensate motor racing was the reverse.

After luncheon the various tests were proceeded with. They consisted of a comparative brake trial, in Fore Street, between a motor car and a horse-drawn vehicle, the Mayor having offered his own horse and carriage for the purpose. The results were greatly in favour of the mechanical vehicle. The Lanchester car was pulled up in 15 feet 9 inches from the giving of the signal, as against 29 feet 4 inches by the horse vehicle. Captain Deasy's Rochet-Schneider car came to rest in 24 feet 8 inches, against the horse in 36 feet 5 inches. After the company had submitted themselves to a local photographer's camera, the cars proceeded to Port Hill, where the stopping powers of the cars were further demonstrated. Upon this occasion the police, who by-the-bye were most considerate, were not too particular about the speeds attained, and the cars let their full power out down the hill, pulling up at a high rate of speed in about 25 yards. Hartham was the next point for the cars, where some instructive and clever exhibitions of the steering capabilities of the cars were given. Describing figure eights round posts and a winding course between posts without the smallest mishap brought forth a considerable amount of appreciative applause, and the cars were finally steered with the greatest ease between two posts with only 4 inches clearance allowed to each side. A very pleasant day was concluded by a visit to Bengeo Lodge, the residence of the Mayor, where after tea the cars returned to their respective destinations. Superintendent Foster had charge of the whole of the traffic arrangements, and his tact and help in managing the crowd was of considerable assistance in promoting the success of the meeting.

* * *

From time to time various propositions have been put forward for the construction of Motodromes on the Continent. The effect created by the recent Paris-Madrid accidents has now brought these into strong prominence, and it is astounding the number of suitable spots which are stated to be available for this purpose. No doubt, upon investigation the majority of them will be found to be quite impossible. Amongst those which investigation has favoured may be mentioned a 15 kilometre circuit near Touquet, which is about 250 kilometres from Paris, necessitating a three hours' train journey. Another is at Chambord, about the same distance from Paris, and with an equal length of circuit. A 12 kilometres course is located at Dinard, about five hours' train journey from the French capital, whilst another project contemplates a course in the forests of Fontainebleau and Rambouillet. At Crau there is a promising stretch; at Pau a run of 30 to 40 kilometres is available; and another site is from Arcachon to Biarritz. The suggestion to construct a Motodrome at Spa, in Belgium, which had been practically forgotten, is also now being revived.

THE GORDON-BENNETT RACE AND IRISH FORTNIGHT.

IT is not often that a foreign organisation, particularly a French one, commits itself to such a piece of effrontery as the Society for the Protection of Human Life on the Public Highway of Paris has been ill-advised enough to perpetrate. This organisation has thought fit, in defiance of all diplomatic usage, to send a telegram to King Edward, petitioning him, "in the name of humanity, of progress, and of reason," to prohibit the Gordon-Bennett Race. We know that there are many people in France who have not been anxious to see the Gordon-Bennett Race held in this country, and, presumably, this is the last expiring effort to prevent it from taking place. It is hard, however, to say which is the more surprising, the complete ignorance of constitutional usages in the United Kingdom, or the ignorance of the forms that respect and tradition alike prescribe in addressing the monarch of another country. Needless to say, there is not the slightest probability of any notice whatever being taken of this ill-advised and impertinent action.

THE extra and elaborate provision which is being made by the Automobile Club to eliminate even the possibility of an accident, and to protect members of the public against their own imprudence in venturing into positions of danger, are such that it would appear to be almost impossible for any trouble to arise except possibly to the competitors themselves.

A 7-minute interval between the starting of the cars is being suggested. We hardly see the object of this. In fact, it might bring about the very trouble to avoid which the longer interval is suggested, as from the comparative shortness of the circuit the cars would probably be overlapping each other. In addition it must be remembered that the rules under which the cup is run for require the cars to be started at intervals of two minutes, and that therefore all other competing clubs will have to sanction any variation of this rule. Three minutes has been agreed upon, and possibly this might be increased to four minutes. Beyond this we hardly think it should be necessary to go.

THE Automobile Club headquarters in Ireland during the various events will be as follows: Dublin, Shelbourne Hotel; Newcastle (Co. Down), Slieve Donard Hotel; Belfast, Great Central Hotel; Cork, Imperial Hotel; Co. Kerry, the Lake Hotel, Killarney. The only entrance to the Club Enclosure for the big race will be by the gatehouse of the Ballyshannon demesne, to the westward of the Athy-Kilcullen Road on the main road from Ballyshannon to Kildare. The distance from Dublin to the Club Enclosure, viâ Naas and Kilcullen, is 33 miles, and the road from Kilcullen to the Enclosure will be closed at 6 a.m. on July 2nd. The Enclosure can be reached viâ Naas, New Bridge and Kildare, the distance being 38 miles, and it will be possible to cross the road at Kilcullen at stated intervals on the day of the race.

THE absolutely level stretch for three miles on the Carrigrohane Road, Cork, will be closed entirely by the Cork County Council, on July 10th, to enable the races to take place without any risk of accident. Although the road is thirty feet wide it will not be deemed advisable to let two cars run abreast.

IN connection with the Co. Down events, there will be a Club Enclosure on the Ballybannon Hill between Clough and Castlewellan.

ON July 8th, at the invitation of the Lord Mayor of Belfast, a luncheon will take place in the Belfast Town Hall, when the distinguished foreign visitors and the Club Committee will be asked to meet the Lord Lieutenant of Co. Down, the High Sheriff, and others.

WHEN the German team arrives, in spite of the announcements already made officially and otherwise, it will, we think, be found that the third driver of the Mercedes cars will be Jenatzy, the other two being Baron de Caters and Hieronymus.

TROUBLE appears to be brewing, according to the *Daily Express*, in connection with the French team for the race, the friction arising from the fact that two Panhards and only one Mors car have been selected to represent France, whereas several of the leading manufacturers consider that a third make should be introduced, whilst the Mors Company claim that if two cars of a make are to run, that it should be their cars which should have precedence. We hardly think anything serious is likely to come of the matter, however, but the fact of the dispute arising demonstrates the difficulties which the ruling clubs have in determining upon the best course to pursue, having regard to the manufacturers' personal interests and the industry generally.

ALEXANDER WINTON, who with Percy Owen crossed the Atlantic this week, starting last Saturday in the "Campania," states that he has no intention of racing with M. Henri Fournier. Shanks, who arranged the three meetings for July 25th, August 1st and 12th, is stated to have had no authority to act on Winton's behalf. It seems somewhat strange, however, that no contradiction has taken place before. The original announcement was made as far back as January. C. J. Wridgway will also be crossing on the "Teutonic" to Great Britain on the 10th instant, accompanying, as we announced some time ago, Mr. L. P. Mooers. They are delaying their departure so as to give Wridgway an opportunity of trying the Peerless racer against Barney Oldfield, on the Ford racing car, on the Empire track, Yonkers. Wridgway may possibly be an alternative driver on the Peerless car to L. P. Mooers.

ALEXANDER WINTON had a spin with his "New Bullet," of which we gave some particulars last week, on the Glenville track a few days before he started for Europe. His time for the mile is given as 1 min. 2 secs., although he is reported to have stated that it was not his intention to attempt anything particularly fast.

CANON BAGOT's residence at Fontstown has been secured by the A. C. de France as a garage for the representatives of the French club. Fontstown is about midway between the starting point and the Moat of Ardscull. The

Moat has been secured by Messrs. Mecredy, Percy, and Co., where they will erect a grand stand, and will also establish a "camp" for the use of those who wish to be on the spot the night before the race.

We are glad that those catering in Ireland for the influx of visitors during the Fortnight have realised in good time the serious consequences likely to result from the excessive charges which it has been stated are likely to prevail during the tour of the automobilists. Strong steps have been taken by a number of those interested to remove this idea, and the Irish Automobile Club has prepared a list of the leading hotels likely to be visited throughout the country, setting forth the charges for hotel accommodation, and specifying the garage room available for cars in each case. This should go far to remove the bad impression which has been created by a selfish few, as the charges set forth are not only reasonable but extremely moderate, and, as the tariffs have been arranged definitely and as all rooms can be secured in advance on the terms stated, all fear of imposition should disappear. There is no doubt that a number of owners who are situated near the course will overreach themselves in their greed as, already, schemes are being matured by means of which ample accommodation will probably be provided in various camps, and, when too late, more reasonable views may be taken as to the value of sleeping accommodation for a single night.

The preliminary programme of the motor speed trials should bring forward some good sporting contests. The classes are as follows:—

Motor Cycle Section—

A^1, Motor cycles up to 70 lbs.
A, Motor cycles up to 104 lbs.
B, Motor cycles up to 170 lbs.

Tourist Section—

C, Tourist cars costing £300 or under, which need not carry more than two people.
D, Over £300 and up to £650, to carry four people.
E, Over £650 and up to £1,000, to carry four people.
F, Over £1,000.
G, Steam tourist cars up to £800, to carry a full complement of passengers.

Racing Section—

H, Cars weighing under 650 kilogs. (12 cwt. 3 qrs. 5 lbs.).
J, Cars not more than 1,000 kilogs. (19 cwt. 3 qrs. 20 lbs.).

On July 4th, at Phœnix Park, Dublin, there will be races in the motor cycle section for Classes A^1, A, and B; tourist section, Classes C, D, E, F, and G. In the racing section for Class H, for the Irish Automobile Club 100 guinea challenge cup and purse of 20 guineas. Class J, for the Irish Automobile Club 200 guinea challenge cup and purse of 20 guineas.

All the above events will be run over the full course of one mile and one kilometre = 2,853·6 yards, from a standing start, in heats of two cars or six cycles.

The open events.—For Class K, scratch race for the *Daily Mail* 100 guinea challenge cup, which will be presented to the fastest car, weighing under 1,000 kilogs., over the flying kilometre, irrespective of motive power employed, provided the kilometre is covered under 40 secs. = 90 kiloms. or 55·92 miles per hour. The cup becomes the property of the winner who may win it two years in succession. Mons. Leon Serpollet is the present holder. Class L, scratch race for the *Autocar* challenge cup, open to vehicles of any power or weight irrespective of motive power. The winner will become the holder of the cup provided that, if there are not three starters, the kilometre is covered in not more than 40 secs. = 55·92 miles per hour. The cup becomes the owner of the car winning two years in succession, or three times in all. Mr. Chas. Jarrott is the present holder.

At the Castlewellan Meet, Co. Down, on July 7th, the races will be, for the motor cycle section, a four-mile speed trial for Classes A^1, A, and B; an open hill-climbing event for Classes A^1, A, and B. In the tourist section, Classes D, E, F, and G will compete in a handicap race over about four miles from Clough to Castlewellan for the *Graphic* Trophy. The cars must be ordinary tourist cars of any make, carrying four passengers, and be over the value of £300 and under £1,000.

In the racing section classes H and J will compete over a four-mile course for two cups presented by the Royal Ulster Yacht Club. The meeting will finish with an open hill-climbing event for any car, irrespective of weight, driven by a spirit internal combustion engine, for the Henry Edmunds bronze trophy, distance about 1,200 yards. The course will be from the mill in the valley at Castlewellan towards Clough, the cars starting from rest on the flat exactly 100 yards from the beginning of the ascent, the finishing post being on rising not level ground.

On July 10th, at the Cork meeting, the races will be for both the tourist and the racing sections, open handicaps over two miles for classes C, D, E, F, and G, and H and J, respectively, for the Mayor and Corporation of Cork, two silver cups. The Killorglin (Co. Kerry) hill climb on July 14th will be open to tourist cars only, viz., classes C, D, E, F, and G, the distance is about one mile, and the winner will secure the County of Kerry Cup. Entries for this event can be lodged up to July 11th, at the Imperial Hotel, Cork. Otherwise entries for the other events must be made at the Automobile Club, Piccadilly, not later than noon on June 15th. Late entries at 50 per cent increase in fees will be received up to noon, June 25th, when entries will finally close. In addition to the specified cups, silver medals will be awarded in practically all the events, and bronze medals in several of the races. The entrants must be members of the A.C.G.B.I., or of an affiliated club, or a recognised foreign club, or, in the motor cycle section, must be a member of the Auto-Cycle Club. Drivers need not necessarily be members of the recognised clubs. Professional drivers may be employed, but must be registered under the competition rules of the A.C.G.B.I., for which there is no fee charged. In the tourist section cars must be of the recognised tourist type, and any fitted with engines giving over 30-b.h.p. will not be admitted.

* * *

The well-known firm of balloon constructors, Messrs. Spencer, of Highbury, hope to have their powerful airship ready for an ascent from the Ranelagh grounds by July 11th. The new machine will be on the same general lines as the Mellin airship, which, as our readers will recollect, careered under favourable circumstances across London last summer. It will, however, be much more powerful, being capable of carrying two passengers, and being fitted with a 24-h.p. motor. As in the case of the Mellin, the propeller is in front, acting as a tractor, and it is estimated that the airship will be capable of developing a speed of 30 miles an hour through the air, which will render it independent of light breezes.

RACES, RECORDS, AND TRIALS.

The Hill-Climbing Competition at Sheffield.—WE are now able to give the full results of this competition, and for the convenience of our readers we repeat the formulæ which were adopted from the A.C.G.B.I. by the Sheffield and District Automobile Club.

Hill climbing—

$$\text{Marks} = \left.\frac{3300}{1}\right\} \times \frac{(6 + \text{No. of pass.})}{1500 + £} \times 5{\cdot}9 \times \text{speed in m.p.h.}$$

Accuracy of advertised h.p.—

$$\text{Marks} = 250 \times \left(\frac{140}{100} \times \frac{\text{h.p. performance}}{\text{h.p. declared}}\right)^3 \text{ with a maximum of 250.}$$

Where h.p. performance

$$= \frac{(\text{laden weight, lbs.} \times 461) + (7{,}850 \times 35 \text{ lbs. per ton laden weight.})}{33000 \times \text{time, minutes.}}$$

Not only the marks awarded both for hill climbing and for "accuracy of advertised h.p.," but also the data from which they were calculated will be found in the table.

It is interesting to notice how these formulæ—which are amongst those to be used in the September Reliability Trials—work out in practice. The first of them was intended to give approximately 1,000 marks as a maximum, and from this point of view it is satisfactory. The average gradient per cent. is represented by the figure 5·9, the hill being as we have already said about 1 in 17 for the 1½ miles. The introduction of the price of the car as a factor in the formula, even though it is diluted by the addition of the figure 1500, makes a considerable difference to the marks awarded, although in this particular trial it does not amount to as much as it might easily do in the September trials. Considering that the marks might be affected to the extent of even 30 per cent., it will be seen that a very misleading feature is introduced, and that those purchasers for whose benefit such trials are really organised cannot ascertain the relative capabilities of the different cars. Since they could not fail to recognise the difference of cost between one vehicle and another it is difficult to understand why a formula should be spoiled in a vain attempt to include a factor which they can apply more accurately, and of which they have an even better knowledge than the officials. In the present case a 12-h.p. Humber car is priced at £600, although similar machines can be obtained at a lower figure to-day. There may well be cases also in which an owner has spent money on his vehicle, and in which the value of it has been greatly increased, yet this fact would never emerge from the marks obtained by his car, and an erroneous impression would be conveyed to others.

In the "accuracy of advertised h.p." formula, the full marks—to the value of 250—are obtainable by any car in which the lost power in the transmission does not exceed 28·6 per cent. of that developed by the engine, that is, provided that the engine develops its nominal power. The h.p. shown by performance, however, is calculated from a formula in which the draw-bar pull on the level is assumed to be 35 lbs. per ton, which, as we have pointed out in connection with this competition (in our issue of May 23), is ridiculously low. Apart from this, however, the effect of cubing the expression in brackets in the formula is to reduce the marks so that a 30 per cent. loss of power gives 235 marks, a 40 per cent. loss gives 148 marks, and a 50 per cent. loss gives only 86 marks, so that it will be seen that anything which reduces the apparent "h.p. performance" reduces the "accuracy of advertised h.p." marks enormously.

If, in the Sheffield Hill Climb, the draw-bar pull had been taken at 70 lbs. per ton, which, considering the condition of the road, would have been nearer the mark, and possibly still below it, the results shown would have been very different, for although the greater part of the work done in ascending the hill was required for lifting the car a vertical height of 461 feet, yet the "h.p. performance" figures would have been increased by about 21 per cent. Under these circumstances the marks for "accuracy of advertised h.p.," would be greater by an even higher percentage—for instance, Mr. H. Cooper's Wolseley car would have received 148 marks instead of only 86, or an increase of 72 per cent.

It is a pity that, if such data as "accuracy of advertised h.p." are required at all, that they should not be such as to set a good example to manufacturers by being accurate themselves. It is, of course, difficult to estimate what the draw-bar pull should be taken at for any given road surface, and when in a certain condition, but we would suggest that it would be well worth while to measure the resistance to traction by a dynamometer, and to do so just prior to the trial. A recording dynamometer could not only be made to give this data, but there is no reason why it should not indicate the actual power required for a climb, and obviate the necessity for any other measurements at all being taken. One such machine would serve the A.C.G.B.I. and all the provincial clubs for some little time to come, and we have no hesitation in saying that the money spent on it would be well laid out. Failing some such means of securing accurate results, however, we do not think that any attempt should be made to indicate to the public the accuracy of the makers' statements concerning the cars sold by them; such figures as those contained in the tables are most misleading.

In the cycle section Mr. W. H. Brown, on a Farnell, made the distance in 7 mins. 9⅗ secs., and Mr. W. S. Gilder, on a Royal Enfield cycle, took 7 mins. 23⅗ secs. Both these machines were tricycles.

Owner.	Make of car.	No. of passengers.	Weight of car.	Laden weight.*	Price of car.	"35 lbs. per ton laden weight."†	H.P. declared.	H.P. as shown by performance.	Time in mins. and secs.	Speed Miles per hour.‡	Hill-Climb Marks.	Acccuracy of advertised h.p. Marks.
			c. qrs. lbs.	lbs.	£							
F. Churchill ...	Hallamshire ...	3	17 0 0	2,324	350	36·3	10	3·36	12 12	7·4	701	26·0
Pickford, J. H. ...	Wolseley ...	4	21 3 0	2,996	380	46·5	10	4·3	11 54	7·6	787	54·0
Hind, Ben ...	Clement ...	2	12 21 0	1,645	365	25·8	9	1·7	13 40	6·6	551	4·6
Drew, W. N. ...	Wolseley ...	3	15 3 0	2,184	325	34·1	7½	3·07	12 35	7·1	682	47·0
Cooper, H. ...	Wolseley ...	4	19 1 21	2,737	380	42·7	10	5·0	9 38	9·3	963	86·0
Barber, Jas. ...	Belsize ...	4	20 2 0	2,856	375	44·6	12	4·34	10 56	8·25	856	32·6
Ellis, J. ...	M.M.C. ...	3	10 0 3	1,624	255	25·3	8	1·5	18 29	4·87	489	4·0
Truelove, A. ...	Belsize ...	4	18 3 14	2,674	380	41·7	12	4·31	10 57	8·25	854	31·0
Thompson, P. R.	M.M.C. ...	2	11 1 0	1,540	270	24·0	8	2·0	13 49	6·5	572	10·7
Fawcett, P. W. ...	Humber ...	4	22 2 0	3,080	600	48·1	12	5·6	12 44	7·1	658	63·0
Revill, T. G. ...	Boyer ...	2	10 0 0	1,400	200	21·8	6½	1·8	13 16	6·83	623	14·0
Smith, F. G. ...	Locomobile ...	2	9 3 0	1,372	200	21·4	4½	2·5	9 28	9·5	870	117·0
Hobson, H. F. ...	Century ...	2	4 2 21	805	130	12·5	3½	1·28	11 2	8·15	778	33·0

* Taking weight of each passenger as 10 stone. † Figure used in formula for "h.p. as shown by performance."
‡ Length of hill taken as 1½ miles.

American Records.—Albert Champion, on a 4-cylinder Clement motor bicycle, on May 28th, on the Empire City Track, made a record for the mile of 1 min. 6¼ secs., which beats Chase's world's record of 1 min. 6⅖ secs. On May 29th George Cannon, on the Cooper-Cannon "freak" steam machine, at the Boston Track, covered the mile in 1 min. 3⅖ secs., beating the previous record of 1 min. 5⅕ secs.

THE "Criterium du Quart de Litre," for motor bicycles, organised by *L'Auto*, is now definitely fixed to take place at the Parc des Princes, Paris, on August 30th; distance, 100 kiloms. Only 60 competitors allowed. Pedalling will not be allowed. Only machines will be admitted with a cylinder capacity of a quarter of a litre, equal to 250 cubic centimetres, and giving about 1¾-horse power.

Scottish Automobile Club (Western Section).—The official report of the Glasgow-Leeds-London Non-Stop Run has now been issued. Certificates will be issued for those cars which completed the entire distance, except No. 25, which was disqualified. We gave on page 526 (May 23rd) the full particulars of the cars and the causes of the stops, which tally in every detail with those now issued in the report. The results as shown in marks is as follows, the total possible marks in each case being 1,000:—

No.	CARS.	Marks.
5	10-h.p. Lanchester ...	1,000
8	4-cylinder Sunbeam ...	1,000
9	,, ,, ...	1,000
19	Arrol-Johnston... ...	1,000
21	,, ,, ...	1,000
22	10-h.p. Wolseley ..	1,000
23	12-h.p. Argyll	1,000
1	14-h.p. Chenard-Walcker	999
15	Rochet-Schneider ...	999
20	De Dion Bouton ...	997
6	10-h.p. Wolseley ...	996
2*	Gladiator	994
10*	Argyll	994
11	Gardner-Serpollet ...	994
3	24-h.p. De Dietrich ...	990
17*	12-h.p. G. Richard ...	989
24*	Peugeot	985
18	24-h.p. G. Richard ...	808

MOTOR CYCLES.

No.		Marks.
3	Quadrant	995
8	Humber	988
9	,, ...	980
7	Brown Bros.	951

* Loss of marks for tyre troubles: No. 2, 4; No. 10, 3; No. 17, 11; No. 24, 6.

THE Perigueux Hill Climb has been postponed owing to difficulties with the authorities. The Mont Cenis event of the Swiss Automobile Club for July 5th, it has been suggested, may possibly be stopped, but so far the Club officials have received no intimation to this effect.

THE Side-Slip Competition, which is being organised by the A.C.G.B.I., will commence in the first week of November next, when Eliminating Tests will be started for the purpose of saving the judges unnecessary labour with obviously unworthy apparatus. The rules governing this competition do not differ from the chief points which we published last January (p. 126). Entries are to close on October 17th next.

FIFTY per cent. of the net profits of the sports of the Bristol Centre of the National Cyclists' Union are to be devoted to the relief of the sufferers by the recent motor bicycle accident at Bristol. At Exeter, in consequence of this accident, the local cycle club abandoned their idea of a motor cycle race for their sports, which appears to us to be a senseless proceeding, as under proper conditions no harm should be possible to others than the competitors themselves.

DIFFICULTIES appear to be rising in connection with the proposal of the A.C. of America to run their autumn reliability trial to Montreal. This project was originally put forward, as announced by us last year, upon the finish of the Boston run. It would appear that the Canadian authorities are not at all in favour of receiving the suggested visit, and considerable difficulties are anticipated in connection with the Customs authorities, which may help to entirely alter the plans for the trial. It is specially curious to note that the greatest difficulty is anticipated from the American Customs officers upon the return of the cars from Canada, and the prospect of the returning cars being mulcted in the full Customs duty does not commend itself to the American mind.

TROUBLE has been brewing with the authorities in connection with running the Circuit des Ardennes race on June 20th and 21st, which may possibly lead to its being postponed until the end of July, when extra precautions will be taken to prevent the possibility of any repetition of the accidents in the recent Paris-Madrid race. The surroundings of this course are totally different to those in Paris-Madrid, but apparently the hysterical shriekings of the daily press have had a similar effect upon the authorities in Belgium as in other parts of the world. The extra precautions, however, proposed are unquestionably good in themselves, and should tend to minimise any danger which might otherwise possibly arise. The number of competitors will be limited to about 40, and the cars will have to be of a guaranteed and approximately the same speed, so as to prevent frequent passing on the circuit. The course will be strictly guarded and railed off at all points where side roads join the main thoroughfare.

Motor Volunteer Corps.—The demand for cars during the Whitsun holidays by various sections of the army has far exceeded the supply, and apparently the more they are brought into active service, the more is their remarkable usefulness appreciated by commanding officers.

MR. KER-SEYMER and Lieut. Trippel have been doing duty for the general officer commanding home districts for the last week.

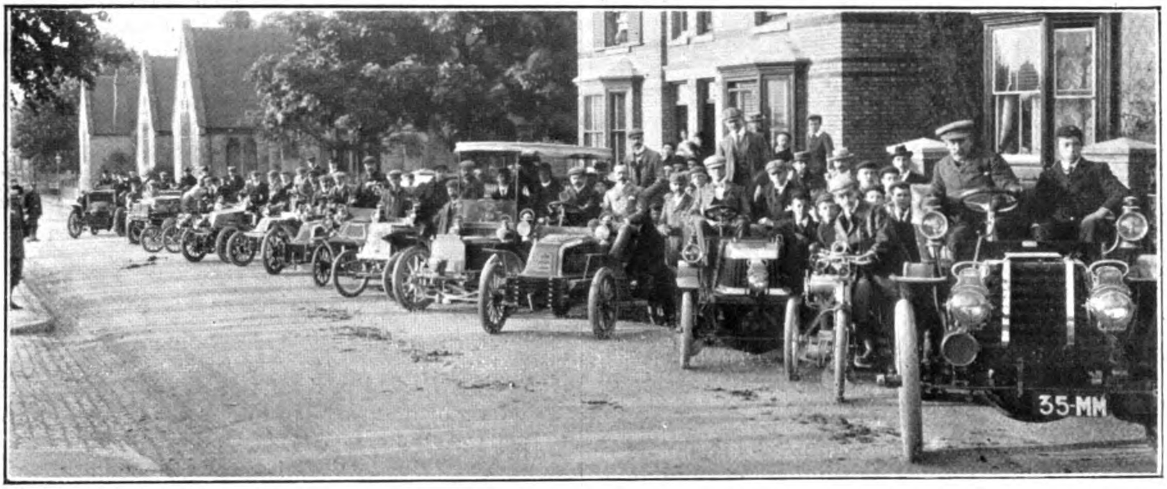
MR. NOEL KENEALY has been doing duty in connection with the large signalling scheme by the brigade signalling officer, Second London Volunteer Infantry Brigade, on May 30th to June 1st.

THE general officer commanding 4th Army Corps has requisitioned for the services of members on the 13th and 23rd of June.

THE Inspector-General of Fortifications employed the services of a member of the corps for his inspection of Hounslow and Windsor on June 2nd.

A PROCESS invented by Mr. John Muir, of Leith, Scotland, of tanning pig-skins, it is stated, will enable this substance to be substituted for rubber for tyres. A round sum of a million sterling is the price reported to have been paid in America for the rights for that country.

THE scheme for utilising Olympia as a garage, to which we referred some few weeks back, is developing. In addition to utilising the main building as a permanent exhibition for all types of automobiles, it is proposed to attach to the undertaking a garage club, and provide members' rooms, including a billiard room. In the early stages overcrowding need hardly be expected as it is announced that there is accommodation for at least 2,000 vehicles. The garage is to be open day and night throughout the year, and members of the Garage Club will have the run of the whole building, including the permanent exhibition. Automobile literature is to be provided, and the annual subscription, entitling to garage for one motor car, will be 15 guineas, while members not owning a car pay 5 guineas per annum, and members' motor cycles will be stored for three guineas per annum extra. There will be a suite of rooms for ladies, who may be introduced by members. It is proposed to open the Club during the present summer, and the first 1,000 members are to be founder members, and be admitted without an entrance fee.



Kent Automobile Club.—Reproduced from a photograph, taken in College Road, Maidstone, of a few of the members of this Club at their first Inaugural Meeting in commemoration of the foundation of the Club.

The Cheltenham and Gloucestershire Automobile Club.—The start of the Whitsun tour of this club on May 30th was to Ludlow, a distance of 55½ miles, where the Angel Hotel was made the headquarters. On Sunday the Crown Hotel, Shrewsbury, was made the mid-day halt; Montgomery, a further 22 miles, being the stopping place for the night. On Whit-Monday the total distance run was over 95 miles, the first stage being to Hereford and from there back to headquarters at Cheltenham. Although the club has arranged a number of fixed dates and towns to visit during the season, the events are more "club meets" than regular runs, as members are always left to choose their own route to arrive at the meeting places for meals and stoppages. The club has now a membership of nearly 50, the members being with very few exceptions practical automobilists. The Honorary Secretary, Mr. H. Dyer, advises us that at the general meeting, held on Thursday this week, the legislative proposals of the Automobile Club were the subject for discussion. Next Saturday's meet is at Stow-on-the-Wold; Sunday, June 14th, Malmesbury; and Wednesday, the 17th instant, Tetbury and Painswick will be visited, and then back to Cheltenham.

Kent Automobile Club.—We last week recorded the formal foundation of this Club and gave the names of the Provisional Committee elected. We are now able to reproduce a photograph of the first gathering of a few members of the Club in commemoration of its foundation. It has been determined to make the Star Hotel, Maidstone, the headquarters of the Club for the present, and all members elected on or before the 30th instant will be termed Founder Members, and be admitted without entrance fee. Already about 75 members have given their names in for joining, and an inaugural dinner will take place on the 24th instant, when ladies will be admitted to the gathering.

Yorkshire Automobile Club.—Messrs. Chippendale & Co., Harrogate, official repairers to this Club, have acquired the Grand Hotel Garage, Harrogate, which gives accommodation for fifty cars. The Bradford Motor Company, Bellevue, Bradford, who can accommodate 100 cars, are to be officially recognised for repairs.

Derby and Nottingham Automobile Clubs' combined run to Ashby-de-la-Zouch.

The Coachmakers' Company, in their annual design competition, offer a prize for drawings of a motor car.

The Earl of Morton has just obtained a Daimler carriage especially suited for work in connection with his estate.

The vote of the Cyclists' Touring Club members has decided that automobilists *as such* shall not be admitted to membership in the Club.

For the Whitsuntide holidays the Prime Minister drove on his car to Littlestone, where he is spending the first part of his Whitsun holidays in his favourite pastime of golf.

What practically amounts to a replica of the 22-b.h.p. shooting car recently supplied by the Daimler Motor Company to the order of the King, is now under construction for the Marquis of Londonderry.

The Vice-President of the Yorkshire Automobile Club, Mr. Harrison Benn, has just taken over his 22-b.h.p. Daimler carriage, which has been specially fitted with a "Roi de Belge" body by Rothschild.

The motor omnibuses which we announced were to be started in Torquay will be supplied by Clarkson, Limited, who submitted their cars to a severe trial on all the roads and hills in the town and district.

Last week 20 small Regal cars were sold by Oscar C. Selbach—a record. From other automobile quarters we hear of equally good business being done, so that the vapourings of the anti-motorist hardly appear to be having the effect upon the industry which had evidently been sincerely hoped for by these enemies to progress.

Miss Mena Alix, who, as we stated a few weeks ago, was announced to appear at the Olympic Music Hall, Paris, is now giving her sensational performance at the London Hippodrome, where she is advertised as "hooping the hoop," on an imitation motor car. The journey round the hoop is stated to take 2½ seconds, giving a speed for a part of the journey estimated at 300 miles an hour. We wonder who made the calculation.

The Ariel Cycle Co. are desirous of letting it be known that they have not the smallest intention of discontinuing manufacturing their own engines for motor bicycles, and state that the rumour circulated recently to that effect is without foundation. So far from discontinuing the work, they inform us that they are rapidly making arrangements for turning out their 2¼-h.p. engines in larger quantities than before, which they are enabled to do as the whole of the castings of the Ariel engines are made in their own works.

Mr. Walter Long, on Wednesday, speaking at Epworth, said self-propelled vehicles were no passing freaks, but were destined to take a practical and useful part in our daily life. In regard to speed limit, whatever change was made would be based upon the evidence of magistrates, chief constables, and men who had to interpret and administer the law; that the present limit was a delusion to those who sought to be protected, and, if anything, helped the motorist to escape. It was as idle to say motors should be abolished because they were objectionable to some people, as to contend that they might be driven at express speed.

The growing popularity of automobiles is well illustrated by two advertisements which have recently appeared for gardeners, both of which make it a condition of employment that the candidates shall drive and look after a motor vehicle, or at any rate be willing to learn to do so. Neither advertisement has any reference to a knowledge of gardening or acquaintance with horticulture.

Last week Lady Rayleigh journeyed to Theydon Bois on the Napier car of her brother, the Prime Minister. The object of the visit was the formal opening of a Forest Fair in aid of the local schools. Subsequently the funds of the fair were largely augmented by short rides being given in Mr. Balfour's car into Epping Forest at 1*s.* per head. The scramble for a seat upon each journey was remarkable.

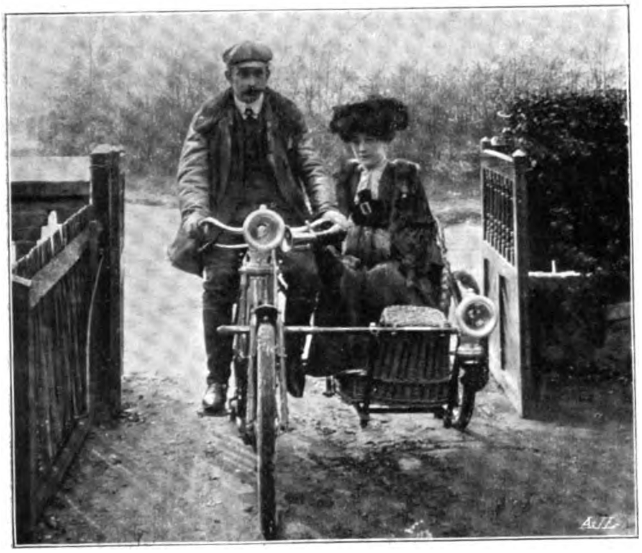
At the Park Royal Show of the Royal Agricultural Society, which opens on the 23rd instant, on their new grounds at Willesden, special provision will be made for standing accommodation for motor cars and cycles. That the needs of automobilism should have been recognised to this extent in so short a time by this great conservative body governing British agricultural interests is indeed remarkable.

Last Monday the Countess of Dudley, wife of the Lord-Lieutenant of Ireland, started from Rockingham, Co. Roscommon, for a tour in Connemara. As far as possible Her Excellency availed herself of the motor car for the various journeys, the first stage to Castlereagh being accomplished by this means, and subsequently through Connemara to Recess motoring was again resorted to. Lady Dudley was accompanied on her tour by the Chancellor of the Exchequer, Mr. Horace Plunkett, and Sir Gilbert Parker, M.P.

Under the title of the City and County Garage, Messrs. Scaife and Pearson, motor engineers, are inaugurating at the White Swan Hotel, Pavement, York, a thoroughly up-to-date motor garage, including inspection pits and all the necessary tools for effecting reasonable repairs. Permanent accommodation under cover will be provided for ten large cars, and upon emergency about 100 automobiles can be accommodated on their premises. York is a useful halfway stopping place between London and Edinburgh, and the new installation should prove of considerable convenience to automobilists.

The Albion Motor Car Company, Limited, formally opened their new factory at South Street, Scotstown, on Friday in last week. The new works of the Company are very up-to-date and handsomely fitted, being largely arranged on American lines, both as regards arrangement of the different shops and the principles of premium remuneration for the workmen adopted. High-class machine tools of the most modern construction are used throughout the works, a special feature being an automatic pneumatic hammer in the smiths' shop. The assembling and erecting shop is particularly up-to-date in its arrangements, being provided with overhead travelling cranes as well as a large assortment of the most modern machine tools, and a pit for attending to a large number of cars at once. The whole factory is lighted at night by a gas installation on Keith's high pressure gas system, and is warmed in winter by low-pressure steam pipes; the entire shafting is driven by a 33-h.p. Crossley gas engine.

The "Liberty" Sociable Attachment for Motor Bicycles.—This ingenious attachment practically converts any ordinary motor bicycle into a tricycle, and provides a comfortable additional seat for a lady or other occupant in such a way that she or he sits practically alongside the rider instead of behind or in front as with a trailer or fore-carriage. We understand that this attachment has been subjected to severe trials, and has proved very satisfactory. It will fit almost any motor bicycle except the Humber, and for them a special clip is made by which it can be applied. The extra seat is carried on cee springs above a light tubular frame. The frame itself is supported in front by a horizontal tube, the other end of which is clipped to the main frame of the bicycle—on the tube passing from it to the bottom bracket. At the rear, the weight of the frame is taken by being clipped to the rear fork, and by a diagonal stay passing up to the seat pillar. The attachment is the invention of Messrs. Graham Bros., of Enfield, who remain sole agents for their districts. The rights in the invention have been secured by Components, Limited, of Birmingham, by whom it is being manufactured.



"**Once on Board the Lugger.**"—The motor boat has been pressed into the service of the burglar. A safe belonging to a tradesman of Blyth, in Northumberland, was broken into early this week and £50 stolen from it. The thieves are believed to have escaped on a lugger provided with a petrol motor equipment belonging to Mr. Foster, which was lying near, and which is one of the speediest vessels on the North-East Coast. There seems every probability that the up-to-date burglars have made their escape.

The King on Whit-Monday afternoon tested the powers of his new petrol motor launch by making a trip through Romney and Boveney Locks, as far as Oakley Court and back. His Majesty, who was accompanied by Prince Louis of Battenberg, Lord Esher, and the Hon. John Ward, appeared to be delighted with the river Bank Holiday traffic, and particularly with the spontaneous greeting which resulted in many cases from the exuberant spirits of some of the boating parties. The launch behaved admirably, and brought the Royal party back to Windsor by about 6.30 in the evening.

It is difficult, it would seem, to say what a modern automobile will not do when put to it. We are all familiar with the Ivel agricultural motor, which relieves the horse from the disagreeable labour of dragging a plough, but actual application of an ordinary pleasure car for the purpose of ploughing is a novelty. This is reported to have been done very recently near Ashtabula in Ohio, where a visitor's automobile was harnessed to a plough to plough up some rough ground for the purpose of preventing the spread of a fire which had broken out along a line of railway. The car, when harnessed to the plough, took it along at a much greater pace than could have been accomplished with horses, and the fire was effectively stayed.

A correspondent writes to ask whether any punishment can be inflicted on a person warning the drivers of cars of the presence of a police trap in the immediate neighbourhood. We believe that no punishment can be legally inflicted on such a public-spirited benefactor of his race, but we remember that an illegal punishment was attempted on the occasion of the last Commemoration Run to Oxford, when a cyclist who provided himself with a notice board, with the words "Police trap," was set upon by the infuriated constables, his notice board forcibly taken from him and smashed up. We were always sorry that this individual did not think fit to prosecute the police for assault. We do not see that he could have failed to succeed in his case.

Miniature motor cars have been adopted for the purpose of a gambling game. The general nature of the game is somewhat similar to the old horse-racing gambling games, except that the miniature motor cars, which are connected by clockwork, run by themselves round a course on a large table which is provided with suitable obstacles in the way of curves, gutters, dogs, geese, and policemen. A pool is formed, and the competitors are fined various sums varying from £1 for a collision down to 4*s.* for knocking over a policeman, and 2*s.* for putting a dog *hors de combat.* A cynical feature of the game is that a fine of 1*s.* is imposed for running over a fowl if a man or woman happens to be near it, but if not the annihilation of the fowl costs nothing.

The fertility of medical men in bestowing new names on anything in the way of strange mental manifestations is almost immeasurable. They have a "mania" for nearly everything, and when they have given a name they sometimes appear to think that they have added to the knowledge of the subject, though that may be a form of "mania" itself. Dr. Bertillon, a well-known French doctor, maintains that automobilism has produced a new form of mental disease—the speed mania. Excepting that some people have a passion for the delights of rapid transit and get rather reckless when driving we do not see that there is any evidence of real mania. It is a pity not to give the speed craze a name—a name explains so much—why not "tachymania" or "ochymania"?

For the ninth time this year the Lebaudy airship made a series of successful evolutions in the neighbourhood of Moisson, on Monday last.

The formal incorporation of the "Chauffeurs' Association of America" has taken place in the State of Albany, U.S.A.

In Sweden the Stockholmer Automobil-Club has been founded. The Crown Prince of Norway and Sweden is the Honorary President.

Mr. Marconi, it is stated from New York, has joined forces with Mr. Edison, the latter gentleman having been elected a member of the Board of the Directors of the American Marconi Corporation. With two such brains combined some sensational developments should result.

A two-cylinder 8-h.p. motor car has been built, it is announced, at the Deutz Factory, to the designs of the German Emperor. It is stated that His Majesty was quite unassisted in his work, and we are not, therefore, surprised to hear that when the car is forthcoming it is expected to create a sensation.

The first Automobile Club in Canada has been founded at Hamilton, Ontario, where a number of automobilists are located. Races and hill-climbing contests are to be promoted in August during the Carnival Week, and efforts are to be made to secure for some of the events, by way of a draw, Messrs. Alexander Winton, L. P. Mooers, and C. W. Matheson.

A service of postal omnibuses has been organised by the Municipalities of Milan. They are electric vehicles, driven each by two 6-h.p. Thomson-Houston motors, geared direct to each of the hind wheels. The vehicles are of the enclosed omnibus type, and are provided with batteries capable of running 60 kilometres on each charge. A posting box is attached to these travelling post offices, and clerks deal with the letters and parcels as they travel.

Those responsible for law making in Maine (U.S.A.) are more considerate of automobilists than many of their fellow legislators in other American States. Although the speed is limited in town and country districts, consideration for the automobilist has been shown by provision being made for the municipal officers to indicate by signs places of extreme danger on the highway, where by reason of cliffs, embankments, and other natural difficulties, the meeting of automobilists and horses might be attended with unusual danger.

What is probably the largest, though far from the speediest, automobile in practical use at present has been built by the Vehicle Equipment Company, of Hartford, Conn., U.S.A., and is now being run by the American Sight-Seeing Company, of New York. It is a large electrical char-a-banc, having seats for 40 persons, including driver. It is furnished with a battery of 44 Exide accumulators, being driven by two separate motors geared to the rear wheels in the now familiar manner. The vehicle has four speeds forward and a reverse, but with its large size is far from speedy, its best pace being only 8 miles an hour. It is said to cover 30 miles on one charge. The char-a-banc is 22 feet long by 7 feet wide, and weighs ready for the road 3½ tons.

As a result of the joint conference held by the A.C. of America, the A.C. Association, the N.A.A.N., and the New York A.T.A., regulations in regard to the chauffeur question have been arrived at. The chief points provided for are that no commissions of any kind are to be paid directly or indirectly, and that a register of chauffeurs shall be kept in order that the history may easily be referred to of each man when applying for an appointment. Two cases of drunkenness entail entire removal for recommendation from the register. A step in the right direction, to overcome the serious question of responsibility of owners of cars for damage caused when their vehicles are taken out without authority by the chauffeurs, is introduced, the responsibility being placed upon the owner by the direct question being asked explicitly as to what authority each individual chauffeur has to take out a car except under specified conditions, so that the garage keeper may help to check any attempted indiscretions in this direction on the part of the employee.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published June 5th, 1903.

8,035. R. J. Urquhart. Motor-driven vehicles.
10,666. E. Hocke and S. Loffler. Starting and reversing device.
11,093. C. Rainey. Carburettors.
12,715. F. W. Lanchester. Ignition arrangements.
14,477. C. E. Duryea. Water cooling and steam condensing apparatus.
16,055. F. Charron, Girardot and Voigt (Soc.). Brakes.
16,058. F. Charron, Girardot and Voigt (Soc.). Change speed and reversing mechanism.
18,008. Tangye's (Limited). Electrical ignition apparatus.

Published June 11th, 1903.

8,964. P. Davies and others. Steam engines or motors.
9,053. P. Davies and others. Steam generators.
11,276. H. W. Hellmann. Motor cars.
11,545. W. Johnson. Two-speed and free engine devices applicable for motor bicycles.
12,021. J. M. Ross. Variable speed and reversing gear.
14,851. L. Lohner and F. Porsche. Electric vehicles.
15,497. J. Grouvelle and H. Arquembourg. Engine regulator.
16,705. Albany Manufacturing Company, Limited. Tube expander.
16,788. S. R. Batson. Motor bicycles and cars.

Applied for in 1903.

Published May 28th, 1903.

1,948. C. Innes-Baillie and others. Electrically-propelled vehicles.
3,304. M. Guttner. Friction wheel speed gear.
3,736. T. D. Semple. Internal combustion engines.
3,737. E. R. Douglas. Magnetic clutches.
4,167. Soc. des Anciens Etab. Panhard and Levassor. Brakes.

Published June 5th, 1903.

614. L. Renault. Lubricating devices.
2,964. Schweizerische Lokomotiv und Maschinenfabrik. Valves.
4,321. E. Girard and M. Ripert. Inflation of pneumatic tyres.
6,287. A. Stiffe. Explosion engines.

Published June 11th, 1903.

828. A. S. Baldwin. Motor driven road vehicles.
1,940. O. B. Bannister. Wheels.
3,565. C. W. Hunt. Motor road vehicles.
3,935. F. Dondelinger. Free wheel for cycles and automobiles.
3,956. L. B. Gaylor. Automobiles.
7,247. R. W. Haigh. Brakes.
7,398. A. Radovanovic. Explosion engines.
8,124. D. J. Jones. Wheels for cycles and motor cars.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories either as their principal or part of their objects.]

Phœnix Motors (Limited), 736, Holloway Road, N.—Capital, £10,000 in £1 shares. Chief object, to adopt an agreement with J. Van Hooydonk and A. F. Ilsley. First directors: J. Fraser, R. Ibbotson, J. Van Hooydonk, and A. F. Ilsley.

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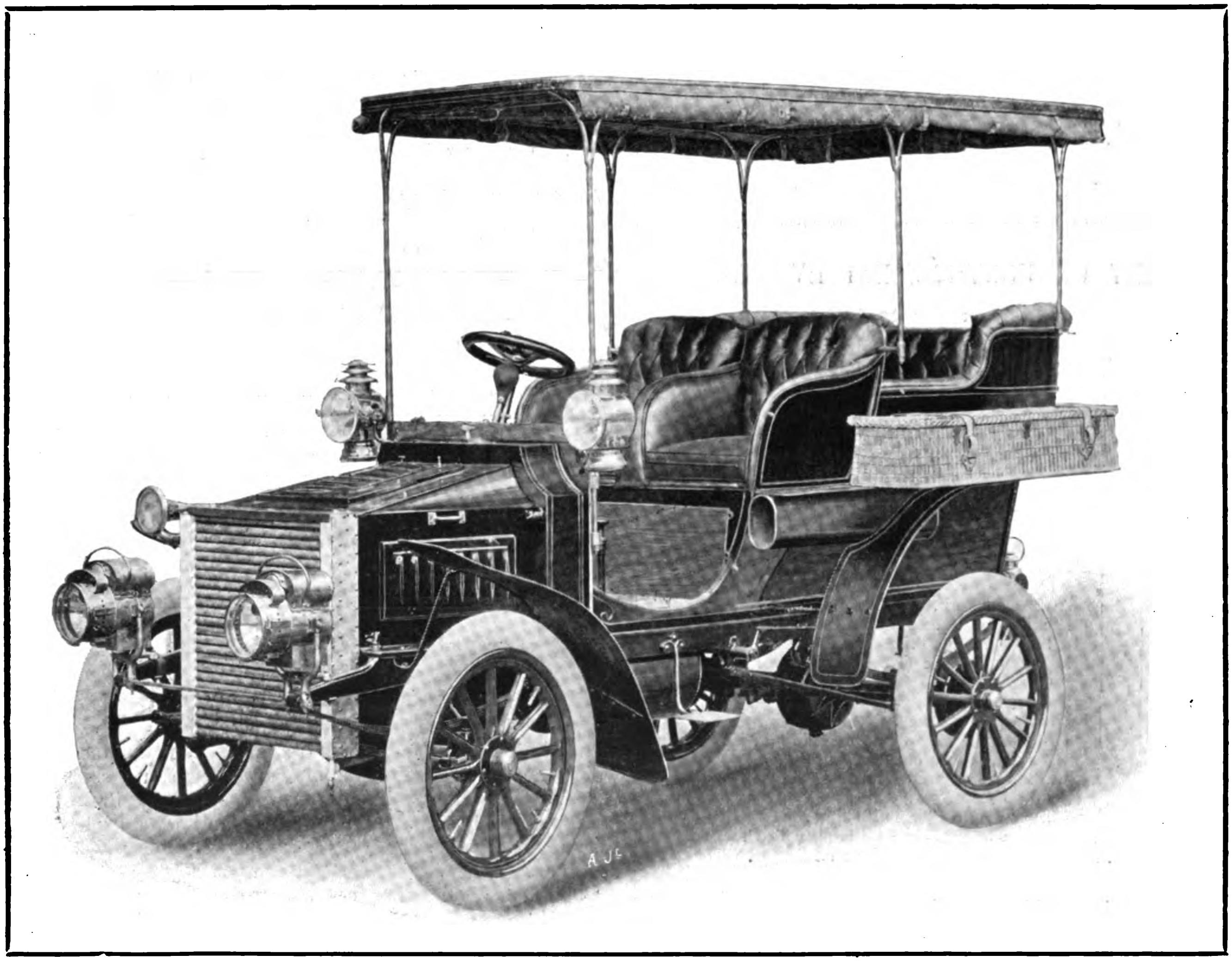

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DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
*June 13 ...		... Gymkhana at Ranelagh.
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park; Motor Cycle Time Trials; Viceregal Garden Party.
July 6 ...		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy; 4 Mile Motor Cycle Race (Newcastle, co. Down).
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork. Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
*July 24 ...		... 100 Miles Quarterly Trial.
July 24–25		... Southport Speed Trials.
July 25 ...		... Midland Auto Club Hill Climb.
*August 10-22		... Tourist Motor Bicycle Reliability Trial.
*August 22		... Annual Open Race for Motor Bicycles.
*September		... The 1,000 Miles Trial.
*November		... Side-Slip Trials.
1904.		
		... *Light Van Trials.
*Feb. 12–24		... Crystal Palace Exhibition.
May. ...		... Electrical Vehicle Trials (6 days).

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.	
June 18–28	... Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 18 ...	... Mont-Ventoux Hill Climb (22 kiloms.) and Water Consumption Trial (*L'Auto*).
June 28 ...	... Laffrey Hill Climb.
July 5 ...	... Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 12-19	... Ostende Automobile Week.
July 19 ...	... Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16	... Race Trelex-Saint-Cergves (Swiss A. C.).
August 30	... Criterium du Quart de Litre (*L'Auto*) 100 kiloms. Parc des Princes.
Sep. 6–13	... Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September	... Udine Exhibition (Italy).
Oct. 15–21	... Leipzig Exhibition.
Nov. 15 ...	... German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

For purchase of electros and illustrations from this journal, please apply to our representatives, Messrs. Bolak's Electrotype Agency, 10, *Bolt Court, E.C.*

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PASSING EVENTS.

THE JUGGERNAUT DAY BY DAY.

IT would be quite impossible adequately to keep pace with the perfect cataract of prejudice and denunciation which the appearance of the letter of "Rusticus" seems to have unsluiced in the columns of the daily Press. It continues to become more powerful and uncontrolled as the weather gets warmer and the dog days nearer. Even so, however, it fails to satisfy the fanaticism of some reactionaries. One writer complains that the "apathy of people in general on this subject is astounding." We really wonder what this gentleman would regard as activity in the question. Another tells us that on the Yorkshire roads the motor cars are so numerous, their speed so prodigious, and their drivers so reckless, that no elderly person or child can possibly escape them, and so the game of misrepresentation, exaggeration, and prejudice goes merrily on. The most extraordinary feature is the exaggeration. It would be exaggeration if all the cars in the kingdom passed through the neighbourhoods of each of the writers in a single day. As things are, exaggeration is no name for it, and even perversion of the truth falls far below the mark. What the correspondence does show clearly is the immense amount of detestation which exists for the motor car in certain classes of mind. This feeling has been fanned by certain sections of the Press, which have attempted to make their readers believe that the automobile movement is merely the fad of the wealthy, and that the abolition of restrictive legislation would benefit only the rich. We have pointed out before, but it is, perhaps, not superfluous to point out again, obvious as the fact ought to be, that even in its present infancy the motor car industry supports directly and indirectly a large number of skilled mechanics and an immense amount of unskilled labour, and if automobilism were to be abolished to-morrow, while a few wealthy enthusiasts might be merely annoyed, there would be hundreds of working men who would absolutely feel the pinch of destitution. This curious want of perspective has been one of the leading characteristics of the whole agitation. However, it is always the sense of proportion which first goes by the board in all cases of popular clamour. What the writers fail to see altogether is that the growth of the industry imperatively demands the removal of restriction. If it is to be throttled here, that will simply mean the granting of bounties to foreign competitors, and never let it be forgotten that prejudice, of exactly the same kind that is manifesting itself now, destroyed the old steam-car industry years ago, when it was promising very well, and when this country was leading the race of mechanical progress, with all other countries far in the rear.

The business has its comic aspects. We are glad to find that that veteran humorist, Mr. W. S. Gilbert, joins in our vote of thanks to Sir Ralph Payne-Gallwey for enlivening the discussion with his buckshot and motor cartridges. Mr. Gilbert carries on the running, and suggests that those anti-motorists who live near a high road, and whose gardens, according to "Rusticus," are enveloped by the passing motors in a dense and never-lifting cloud of dust, might recoup themselves by letting the shooting of their front windows or their gardens to anti-motorists during the season. "Motor-shooting for a single gun," says Mr. Gilbert, would make an admirable advertisement, and appeal strongly to the sporting instincts of the true Briton. This is excellent fooling, no doubt. We are only sorry that Mr. Gilbert has given the discussion this humorous turn so soon, for we were confidently expecting that Sir Ralph's suggestion would be taken seriously by some of the anti-motorists. After Mr. Gilbert's caustics they will be intimidated from doing so.

Sir Ralph Payne-Gallwey's suggestion is apparently of the "nothing like leather" order, for he is not only a good shot himself but an authority on the archæology of weapons of offence. He quite recently published a treatise on the cross-bow with an appendix on the catapult of the ancients, and a contemporary suggests that Sir Ralph Payne-Gallwey heading a detachment of youthful Hodges armed with these antique weapons might co-operate effectively with Sergeant Jarrett on the Ripley Road. This is a libel by implication on Sergeant Jarrett, as he is certainly the "mildest mannered man that ever" stopped a car, and would be the last official to countenance measures of this kind. It was he who arrested the Ripley butcher of some note in his day, and perhaps that local celebrity would be a more suitable person for our contemporary's catapult brigade to co-operate with.

The Scottish Chamber of Agriculture had quite a field day on the same moving subject last week. Some of these worthies are against the removal of the speed limit on the ground that the grazing fields in the Highlands are not fenced off, and that even as it is sheep are occasionally found dead on the roads, which it was implied (though not explicitly stated) must be the victims of motor cars. Another Scottish agriculturist was quite indignant that, owing to the growth of motor car traffic, farmers were becoming actually afraid to turn out their horses on the high-roads after daylight. We think, with all due deference, that it is quite as well that they should be, and that if the police had done their duty north of the Tweed they would have been "frightened" out of this reprehensible misuse of the public roads before the advent of the motor car.

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Of course, a large number of the effusions are the work of journalists who palpably, from the way in which they write, have never seen a motor car except on Bank Holidays, and we cannot help thinking that the virulence displayed is in reality the strongest evidence of the charms which the new locomotion is believed to possess. The element of envy in the minds of the writers is so ridiculously apparent. Their pens are largely dipped in the acrid juice of the sour grape. Nor do we want a better instance of this than the statement made in an evening paper that "so strong is the anti-motor feeling in some rural places that great pains are taken to '*doctor*' the roads for wheel puncture, and in other ways to reduce the pleasures of a motor-car drive to a minimum."

This is wholly and solely an invention. Thanks to the credit of English country people, such tactics are quite foreign to their disposition. But the passage we have quoted would appear to be intended as an incitement.

It is plain that there are some very undesirable individuals indeed in the camp of our adversaries. One of the "Juggernauts" this week admits that on receiving what he regarded as provocation from a motorist he cut him across the neck with a double-thonged whip, and hopes that it "smarts yet," while he actually boasts that in the days when he was opposed to the presence of bicycles on the road he smashed up as many as twenty of them himself.

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The prize, however, for utterly unmeasured vitriolic vituperation would easily be carried off by a writer who contributes, over the signature of "Linesman," one of the most outrageously intemperate letters, that have yet appeared upon the subject, to *The Times*. "Linesman" doubtless had extreme provocation. In the neighbourhood of Burnham Beeches a favourite dog was run over by a motor car "containing," "Linesman" says, "four ruffians—two male and two female." The writer gives a revoltingly realistic description of the condition of the poor dog after the accident, but assumes, it appears to us altogether without justification, that the occupants heartlessly drove on without any expression of regret, well knowing that they had slaughtered the dog. This appears to us a wholly unjustifiable assumption. A large high-powered car can very easily run over a small dog without the driver or occupants being aware of the fact, and as for the dog's dying shriek, at the speed mentioned it would be almost certainly lost amid the noise and rush of the car. It is simply astonishing how noises are left behind at high speed. What the letter does show, however, and show thoroughly, is the amount of prejudice produced by any driver continuing on his way after any sort of accident without some expression of regret. It is this that really infuriates people more than anything else, and drivers cannot be too often appealed to in the interests of the industry to be considerate in this respect. If the occupants of this particular car had stopped, expressed regret, and sympathised with the owner of the dog, *The Times* would not be in the position of having accorded hospitality to the most unmeasured letter which even the "Juggernaut" correspondence has evoked.

So far we fully sympathise with "Linesman's" feelings, though not admiring his manner of expression. The unnecessary destruction (if intentional) of an animal so high in the scale of being as an intelligent dog is morally, though, unfortunately, not legally, a detestable crime. To incite the ignorant and less responsible members of the community to deeds of violence is, however, a crime also, and this is what the writer of the letter does without any disguise whatever. He says quite plainly that "the corpse of a scorching chauffeur" for every poor dog that has been slain on the road would be a trifling price to pay for the restoration of civilisation to the highways of Great Britain. A person putting forward such a proposal in the columns of a newspaper is for the time being nothing short of a criminal lunatic, and, if he continues to suffer in the same way, ought not to be allowed to remain at large. Nor do we think that the paper which has published such an incitement is without responsibility. It would be interesting to recall some of the observations made by *The Times* in the past in regard to much less direct incitements to crime and violence which have appeared in Irish newspapers during periods of agrarian agitation.

ANOTHER BALLOON CHASE.

Balloon chasing by motor car appears to be developing into a highly amusing form of sport. It has all the elements of uncertainty which forms the chief attraction of many other amusements, and at any rate on the part of the driver of the car, where atmospheric conditions are favourable to the balloon, it requires the exercise of considerable judgment, resource, and above all, knowledge of the country and ability to find one's way. The last balloon chase, although only taken part in by a single car, appears to have been about the most successful.

The start took place at 9.30 p.m. from the Ranelagh grounds. A large 45,000 cubic foot balloon belonging to the Aero Club took the part of hare, and ascended from the Ranelagh grounds in the gathering darkness. To make things moderately fair for the car the balloon was adorned with a small electric light, which formed a guiding star for the pursuer, which, by the way, was a 7-h.p. Panhard, a rather small size of car for the work. It was exceedingly skilfully driven by Professor A. K. Huntingdon, of King's College, and as the wind wafted the balloon in the direction of Southampton, it was well able to keep up with its quarry, and even at times got ahead and waited for it. The car kept well in touch with the balloon until actually running into Southampton, when in a mysterious manner the balloon succeeded in giving the car the slip, and escaped across Southampton Water in the direction of the New Forest—coming ultimately to earth near Poole. Dawn was just breaking as the car entered Southampton, and it is possible that the escape of the balloon was facilitated by turning out the electric light, by which its position was indicated, as the day naturally appeared to be more advanced to the occupants of the balloon than to those of the car, penned in among the streets of the town.

THE PRODUCTION OF PETROL.

There can be no doubt that the motor car industry has created a powerful demand for the light hydro-carbon oils which have become generally known as petrol or motor spirit; and it is surprising, therefore, as our contemporary the *Petroleum Review* points out, that no modification whatever has taken place in the practice of the oil industries to meet the demand for this particular product. There seems strong reason to believe that the amount of petrol that can be obtained from a crude petroleum is not an exactly fixed quantity, but depends upon the temperature at which the crude oil is first distilled prior to further treatment.

There is reason to believe that the relative quantities of light and heavy oils which can be obtained from the crude material depend, to a certain extent, upon the actual temperature to which it is exposed during the first distillation. If this view be correct the quantity of petrol ultimately obtainable from the same raw product may be controllable to a certain extent. Raising the temperature in the first instance would doubtless lead to the sacrifice of heavier products, but a nett advantage might result in just the same way that the Vacuum Oil Company are enabled to obtain a larger proportion, as well as a better quality, of lubricating oil by the opposite method—by employing a vacuum—so that a lower distillation temperature suffices.

Considering the high price of petrol it seems astonishing that some such attempt to meet the market has not been made on the part of the great oil producers. Probably the explanation is to be found in their extreme prosperity. At the same time, money is to be made by re-distilling oils and even crude petrols in this country for motor car purposes, and it is surprising that so few manufacturers have taken up this line. One way or another fuel for motor cars will nave to be cheapened, or perhaps it would be more correct to say, prevented from gradually growing dearer, and if the oil producers are indifferent the question of the utilisation of alcohol, to which so much attention has been given in France both by private individuals and Government officials, will be worth serious attention in this country.

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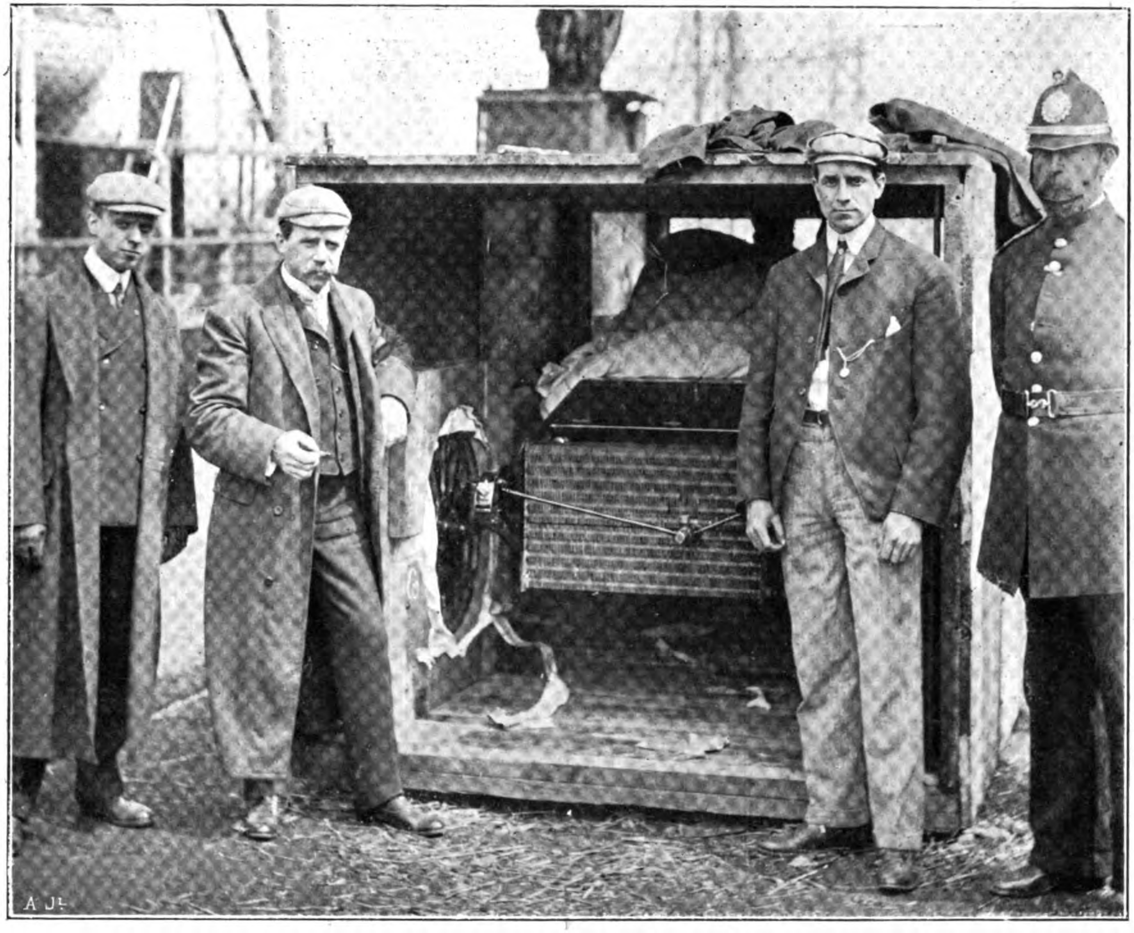
On Wednesday last the Cannstatt Daimler works were entirely destroyed by fire. No more disastrous news could have been received, especially in view of the Gordon-Bennett Mercedes cars being included in the ruin. We await details from Germany, and in the meantime we at once communicated with Mr. Harrington Moore, who is one of the largest holders of Mercedes cars in this country, to learn what effect this disaster would have upon the Cannstatt cars. He informed us that he, being the holder of some 80 cars, the whole of which have been entirely consumed, would probably be at an ultimate loss of close upon £10,000. Mr. Moore left immediately for Cannstatt, and we hope to hear from him that matters are less serious than as at present supposed.

THE GORDON-BENNETT RACE AND IRISH FORTNIGHT.



(*Photo by Lawrence, Dublin.*)

Percy Owen. Alexander Winton. A Winton Car. Anderson, Winton's Mechanician.

At the Harbour Side.—The First American arrivals on British soil.

That adequate provision for the security of the public, and, as far as possible, the minimising of the risks incurred by the competitors in the Gordon-Bennett Race, and during the sports at the Phœnix Park and elsewhere, will be made by the Automobile Club, goes without saying. The exact form which these precautions will take is now being carefully worked out, but in the main the details have been determined upon. In the Cup Race, as far as the public are concerned, at all points at which the smallest danger may be anticipated, the public will be rigorously excluded, whilst, for the safety of the competitors, the cars will be at first started at intervals of seven minutes, possibly 8½ minutes for the first control, so that in the event of the full number of competitors—viz, twelve—starting, the sending off of the cars will occupy not less than one hour and seventeen minutes. At each control, to avoid the necessity of cars having to pass each other whilst racing, the arrangements will probably be that the intervals for starting from each control will be so calculated as to practically preclude the probability of one car having to pass another on the racing section, all passing being done within the controls' boundaries. For ensuring this the following plan of the result will be adopted. In the event of the starting interval being, say, 6 minutes at any control, and at the next control the second car which started has caught up the first car, as to be within 3 minutes of its arrival, or 50 per cent. of the time allowance, then at that control the second car shall be re-started in front of the first car, it being, apparently, the faster of the two, and the time which will elapse between the starting of this car and the next will be the full time allowance specified for that special section of the road. Of course no provision can be made for breakdowns from whatever cause, and that element of uncertainty is the only flaw which we can see in the working of this arrangement.

The Yorkshire Automobile Club have secured a good pitch for their members in a field near Ardscull which gives a commanding view of over two miles of the road on which the cars will compete. Subject to sufficient members joining, the Club are arranging to erect three large sleeping tents and a dining tent, to include the necessary cooking utensils, to accommodate fifty persons during the Race Day and the night before and after the race. The cost for this accommodation, exclusive of food, which is to be arranged for and charged at net cost, will be about £1 per head.

Messrs. S. F. Edge, Charles Jarrott, and Stocks are now in Ireland preparing for the race.

Since the latest official notification of the drivers on behalf of Germany was made, there is an inclination to nominate a different team to represent the German Club. Baron de Caters and Jenatzy will probably be two of the drivers, whilst, subject to his acceptance, the third car will be in the hands of the Hon. C. S. Rolls. Hieronymus for the moment has been placed in the reserve category, and with him will be associated Baron de Crawhez and Degrais. The burning of the Cannstatt Works, however, may change all this.

Alexander Winton and Percy Owen duly arrived at Dublin last week, and Winton considers the course an excellent one.

The Winton racers arrived in Ireland before their drivers, the one being the "New Bullet," which will be driven by Mr. Winton himself, and the other Mr. Percy Owen's car. We have already described the former in our issue of the week before last, and have nothing to add to what we then said except that the low speed and reverse gears have now been removed, so that the vehicle will run under much the same circumstances as the C.G.V. 8-cylinder car, the drive being direct from the crank-shaft of the engine to the bevel wheel which drives the live-rear-axle.

L. P. Mooers was booked to start last week, and by the time this week's Journal is in the hands of our readers, should have joined the other American representatives in Ireland. By cable we learn, however, he started Wednesday last, the 10th. C. B. Shanks, of Cleveland, should also arrive this week on the "Umbria." Shanks will be ready, if such a contingency should arise, to take charge of Winton's car in the event of anything preventing the latter driving.

An invitation to lunch at the Dolphin Hotel, Dublin, on the 20th inst. has been issued to the French drivers and their principal associates by the Dublin Corinthian Club, through their President, Sir Charles Cameron, C.B.

By the announcement that the King's visit to Ireland will commence on July 21st, any hope there might have been of his being present at the Gordon-Bennett Race is dissipated.

We are desired by the Automobile Club to draw special attention to the fact that entries for the various motor speed trials at single fees will close on Monday next, June 15th, after which all fees will be raised 50 per cent. No excuse for delays under any conditions will be accepted.

Last week we quoted an item of "news" from the *Daily Express* in connection with the Panhard and Mors cars running in the Gordon-Bennett Race on behalf of France, and we then said we thought there was hardly anything serious in the suggested dispute. We are now glad to find that the whole matter appears to have been entirely without foundation, as the following letter from Messrs. J. B. and F. Purchase, the solicitors to Messrs. Panhard and Levassor, which has been addressed by them to the *Daily Express*, demonstrates. Messrs. Purchase write as follows:—

"Our clients, Messrs. Panhard and Levassor, have instructed us to write to you with reference to certain statements contained in your issue of the 3rd inst. under the heading 'Quarrel among French Makers.' You there make the following assertions:—

"1. That there is quite a possibility that there will be no French competitors for the Gordon Bennett Race.

"2. That the Mors Company object to the arrangement whereby two Panhard cars and one Mors have been selected to represent France in that race on the ground that the Panhard cars have not lately done anything to justify this preponderance, and your *Express* correspondent goes out of his way to emphasize this latter statement by asserting that the Mors Company are quite right in their contention.

"The above statements are mostly incorrect, and in material respects very misleading and calculated to do our clients serious harm in their business.

"In the first place, there is no possibility that the Gordon-Bennett race will not be represented by French cars, as the Automobile Club of France have selected two Panhard cars and one Mors car. The makers of these cars have agreed, and are making all preparations for the race in perfect harmony with each other.

"In the next place, it is quite untrue and most misleading to say that Panhard cars have not lately done anything to justify their preferential right to have two cars entered for the race. As previously stated, the Automobile Club of France have made the selection based upon the racing qualities of the cars for last year, and the fact that the following great races held last year, viz., Circuit du Nord, Paris-Vienna, Circuit des Ardennes (the last race of the season) were awarded to Messrs. Panhard and Levassor, must make it apparent that their selection in the forthcoming race is fully justified.

"The only race of any importance this year is the recent Paris-Madrid fiasco, which was abandoned at its initial stage, and therefore no deductions of merit can be drawn from it, and we think it will not be considered as any discredit that Messrs. Panhard and Levassor's most successful representative, Mr. Maurice Farman, abandoned the Paris-Madrid race from motives of humanity towards his unfortunate friend and competitor, M. Marcel Renault, when he met with his terrible accident.

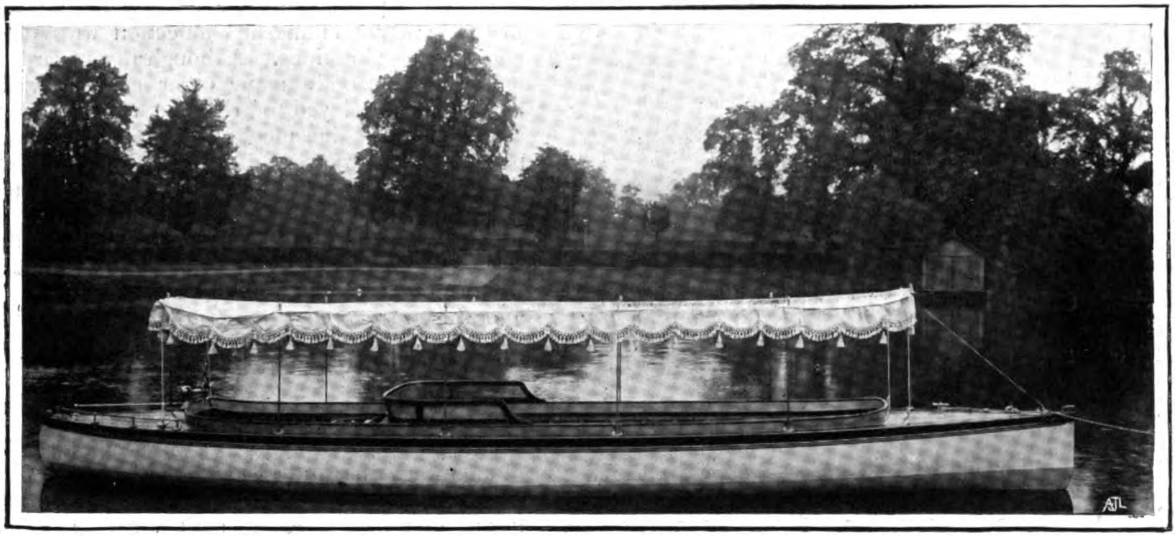
"We are quite sure that you do not desire to misrepresent facts, and we shall be glad therefore if you will give publicity to this letter in a prominent position in your next issue."

A shock of earthquake has been experienced in the near neighbourhood of Dublin. We feel no doubt that capital will be made of the occurrence by anti-motorists generally, and the opponents of the Gordon-Bennett Race in particular. "Will the Automobile Club," we fancy we can hear them asking, "dare to proceed with their project in the face of such a warning from on high as this?"

The missing motor launch by means of which the recent robbery was effected in Northumberland has turned up at Esbjerg, in Denmark, a young Norwegian being in possession.

The Lewes race authorities are not like unto some of their brethren. Recognising the enormous future of automobiles, and the amount of success which the automobilists can help to bring to a race meeting, Messrs. Pratt and Co., the managers of these races, have arranged to provide special facilities for motor cars, for the execution of repairs, and for the supply of petrol to the cars on each race day. A repair pit has been constructed, and two repairers will attend with all necessary tools. Not content with this, in order to give this innovation a proper trial, the usual admission charge to the carriage enclosure of £1 will be suspended in favour of members of the Automobile Club attending on the first day (Thursday). Should the experiment prove successful, similar arrangements will probably be made at Gatwick, Folkestone, Alexandra Park, Plumpton, and other race fixtures under the same management

THE KING'S PETROL MOTOR LAUNCH.

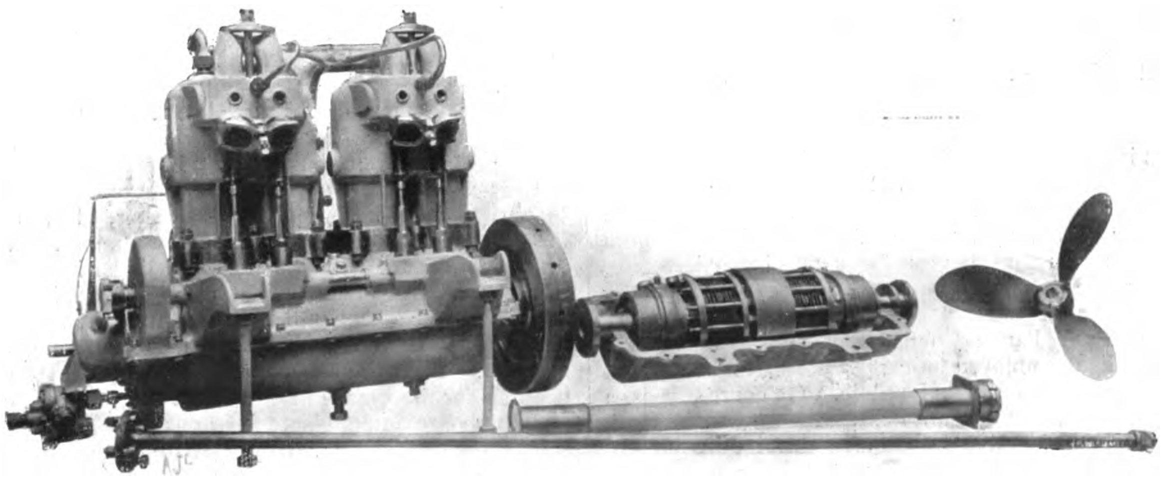


His Majesty the King's 20-h.p. Petrol Launch.

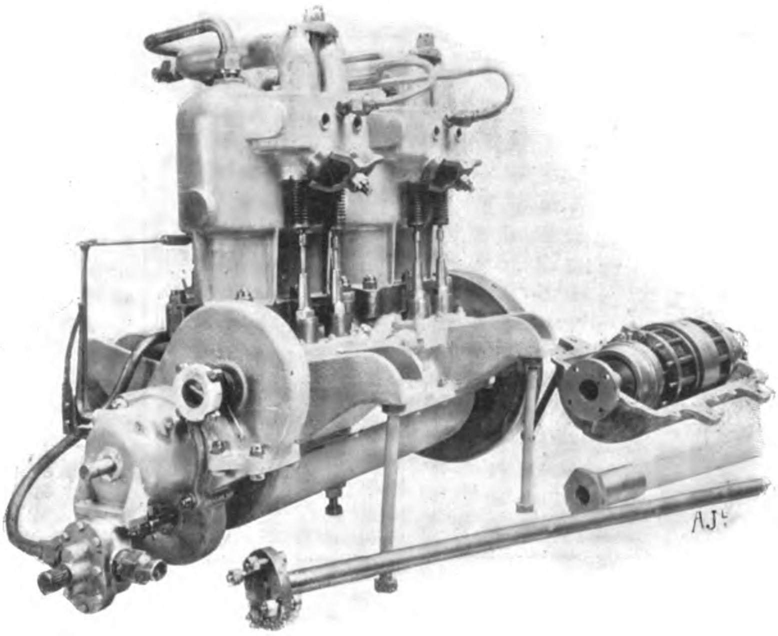
WE have already referred to the application of petrol motors to the propulsion of launches and other craft, and, only last week, we pointed out that the demand for petrol engines for this purpose was rapidly increasing—the high state of development to which they have been brought by automobile manufacturers having rendered them particularly suitable. This demand cannot fail, in its turn, to benefit the automobile industry, and we are, therefore, particularly glad to be able to record that His Majesty the King has purchased a petrol launch—a fact which cannot fail to give a very considerable impetus to the popularity of this type of craft.

The accompanying illustrations represent the King's new launch. It has been built for his use on the River Thames, and is now in the Royal boat-house at Datchet. The hull is built of cedar, and has three skins. It is 32 feet long; the beam is 6 feet, and the depth 2 feet 9 inches. The propelling mechanism, which was built by Messrs. Thornycroft, consists of one of this well-known firm's standard 4-cylinder 20-h.p. motors, and of a special reversing gear of the epicyclic type. The reversing gear, which is very compact, and is shown in our illustrations with the cover removed, is built to the design of Professor Hele-Shaw, whose patent form of friction clutch forms an important part of it.

The seats are arranged forward of amidships, and accommodate 12 persons. The machinery is fixed aft of them, and the steering wheel is in the stern. The engine, the reversing gear, the propeller-shaft, the stern tube with its stuffing box, and the propeller are clearly shown in our illustrations; all these parts are finished and fitted with the maker's customary excellence of workmanship. The circulating pump is gear-driven, and forms a part of the engine. The governor and half-speed gearing is entirely enclosed, and the petrol is fed to the carburettor by gravity. All the moving parts are readily accessible, and the two clutches of the reversing gear are operated by a single lever.



The Thornycroft Propelling Mechanism.



Another View of the Engine, Reversing-Gear, and Propeller Shaft.

The engine runs at any speed up to 900 revs. per min , and is capable of driving the boat at 15 miles per hour.

* * *

A distinctly novel form of rescue is reported to have been perpetrated upon a lady automobilist in America. The following wording of the original telegram, as received from New York, is too delightful to alter by a single word:—

> "While driving her motor car in Bull Street, Newport, Mrs. George C. De Forest lost control over the machine.
>
> "A young labourer sprang into the car and endeavoured to put on the brake, which would not act. He therefore told Mrs. De Forest to rise, and, seizing her, threw himself out, taking the shock himself.
>
> "Mrs. De Forest was only slightly bruised, and the youth picked up his dinner-pail and walked off, apparently none the worse for his adventure."

Possibly we may hear later what became of the motor car. It may be that finding any further perverse tactics useless it stopped of its own accord to await further developments.

There is certainly something to be said for the contention of the Cheshingham Parish Council that the excessive brightness of the acetylene lamps which are employed on some motor cars cause a sense of intense darkness both to human beings and horses for some little time after they have passed. This undoubtedly may, under certain conditions, be an element of danger, and we are disposed to agree with the Parish Council that moderation in the intensity of light employed on cars is a thing to be desired in the interests of the general public. Of course, it is a convenience to have a brilliant light thrown upon the road, but it is of considerable importance during the present hostile condition of public opinion that automobilists should as far as possible avoid anything in any way calculated to annoy other road users if it can be avoided.

THE WELLER PETROL CARS.—Part I.

The Weller petrol cars have already been referred to briefly in our columns in connection with the recent automobile exhibitions. Although in outward appearance they resemble many other cars in which side chains are employed to drive the rear wheels, yet the arrangement of the mechanism and its construction is in many ways very different. Most noticeable is the fact that the whole of the machinery is mounted upon an entirely separate underframe which can be easily removed and is normally attached to the main frame at three points only. In the cars now running, the main frame supporting the body is made of wood, and the underframe is built up of channel steel ; but in future vehicles it is intended to employ pressed steel for both frames, and to make it with a **Ω** cross section.

One of the 4-cylinder cars is seen in Fig. 1 ; it has a long wheel-base, and is fitted with a tonneau body. The main frame is supported upon semi-elliptic side springs in front ; similar springs are employed behind, but their rear ends are connected together by means of a transverse leaf spring, between which and them rubber shackles are fitted. Figs. 2 and 3 are reproduced from photographs taken from either side of the complete underframe. The engine—with its fly-wheel, K, enclosing the main clutch—and the gear-box—with its differential countershaft, N—are fitted to it, and are given their usual positions relatively to one another. The underframe also carries the radiator, S^1, in front, just behind which is a fan, S^2, driven by the engine. The exhaust-box, D^3, is secured at the rear, and the exhaust gases are conducted to it by the pipe, D^2.

The method of attaching the underframe to the main frame is by means of the two bolts, A, which project upwardly from the countershaft bearings, and by the swinging bolt, A^1, which is pivoted to a bracket bridging across the frame, between the front of the engine and the fan. The swinging bolt, A^1, allows a certain amount of movement to take place, and prevents any twisting strains from being imposed by the main frame or by the underframe upon one another.

Other features characteristics of the Weller cars will be dealt with in greater detail accompanied by illustrations presently, but for the benefit of those who do not wish to study them carefully, and yet would like to know their general nature, we shall, in the first place, enumerate them briefly.

The engine is so constructed that one or any greater number of cylinders can be employed, using similar standard parts throughout in any case. For this purpose each cylinder is a separate casting, its jacket and valve-chamber being a part of it. The crank-chamber, also, is divided into units, there being as many similar compartments forming it as there are cylinders. Each cylinder is bolted to its own portion of the crank-chamber. The castings forming the complete crank-chamber are held together by three steel rods which pass through projecting sockets formed on each of them. The two end-castings which provide the outside bearings for the crank-shaft register into the main castings, and there are intermediate bearings between each of the cranks, they being formed by separate castings which have similar registering joint faces turned on them, so that they are held in place by being clipped between adjacent portions of the main chamber. The cam-shaft, too, is made

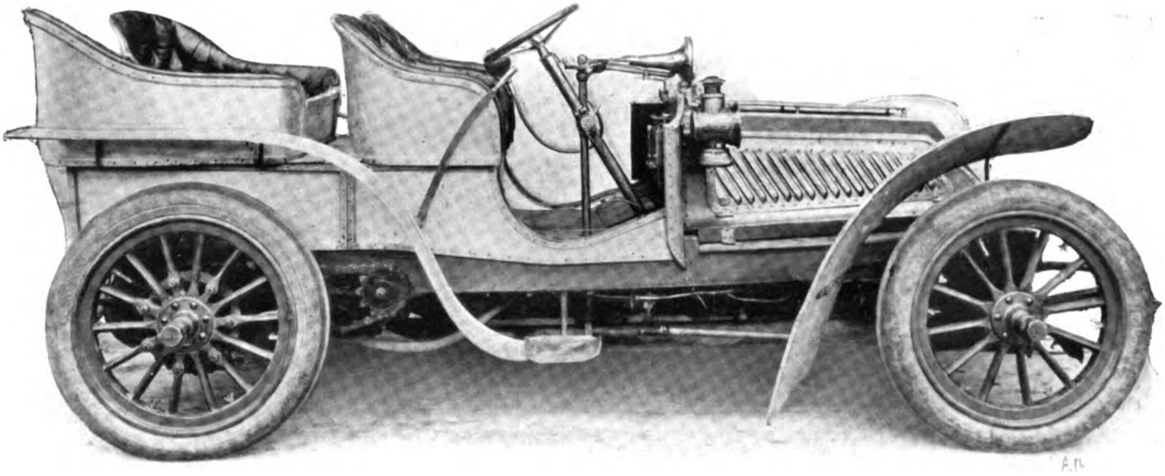


FIG. 1.—The Weller 4-Cylinder Petrol Car.

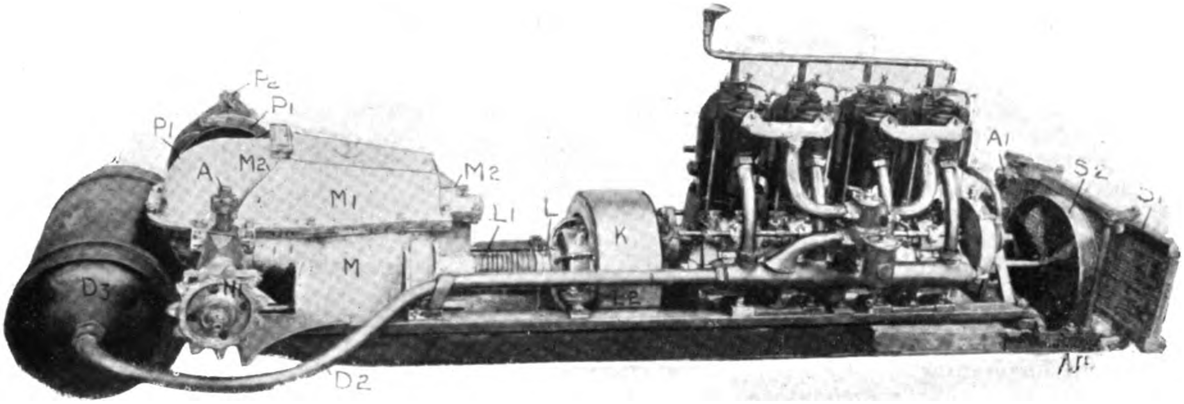


FIG. 2.—The Weller Detachable Underframe (right side).

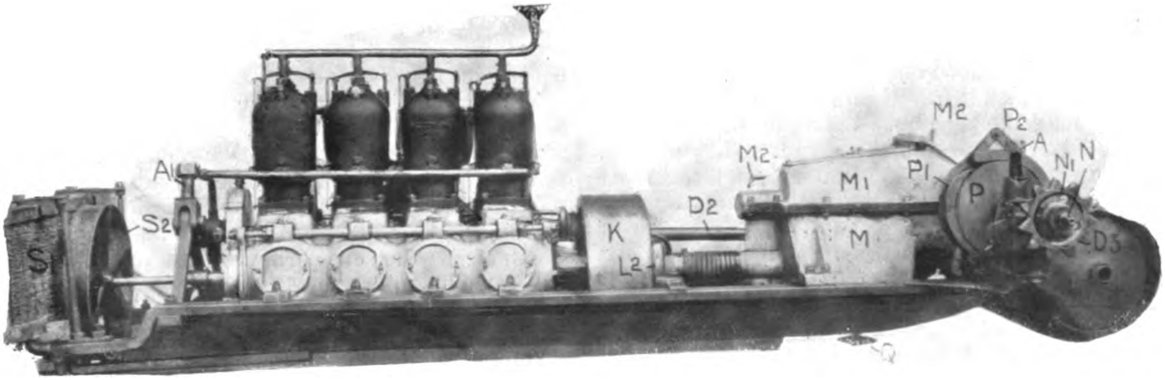


FIG. 3.—The Weller Detachable Underframe (left side).

in unit sections, which are connected together externally by small couplings; the cams themselves are enclosed in a pocket in each of the main castings.

The inlet valves are placed above the exhaust valves, in much the same way that they are in most engines having atmospherically-operated valves. In this case, however, they are operated mechanically, and the peculiarity of the arrangement adopted is that they are opened by a strong spring instead of being opened by the cam. Their own weaker springs tend to close them, but can only do so when the cam relieves them of the pressure of the strong spring. The lifting action of the cam is therefore utilised for closing the valve—the converse of the usual arrangement. The valve gear is so designed that it enables the degree to which the valves are opened to be varied, and this regulation is normally effected by the governor. The quantity of mixture drawn into the cylinders is in this way regulated, and the control is simultaneous for all the cylinders.

The ignition system is of the ordinary high-tension type, but is fitted in duplicate, there being two ignition plugs for each cylinder. The reversing gear is another unusual feature of these cars. It does not form a part of the ordinary gear-box, but is incorporated into the main clutch. When the clutch is in engagement for running forward in the usual way, the epicyclic train of wheels which forms the reversing gear is inoperative, and merely revolves as one solid piece with the flywheel. The same foot-pedal that withdraws the clutch, if depressed still further, introduces the "reverse," and this it does by causing one member of the gear to be brought into contact with brake blocks which hold it stationary. Any of the speeds provided by the change-gear are thus available whether running forwards or backwards, and, as the reversing gear also gives a gear-down of about 2 to 1, the actual speeds at which the car runs backwards is about half that at which it travels forward with the change speed-lever in the same position. Owing to the "reverse" being introduced by a kind of brake action, and by friction, it can also be used for retarding the car when it is travelling forward, and it thus enables the direction of motion to be changed very rapidly.

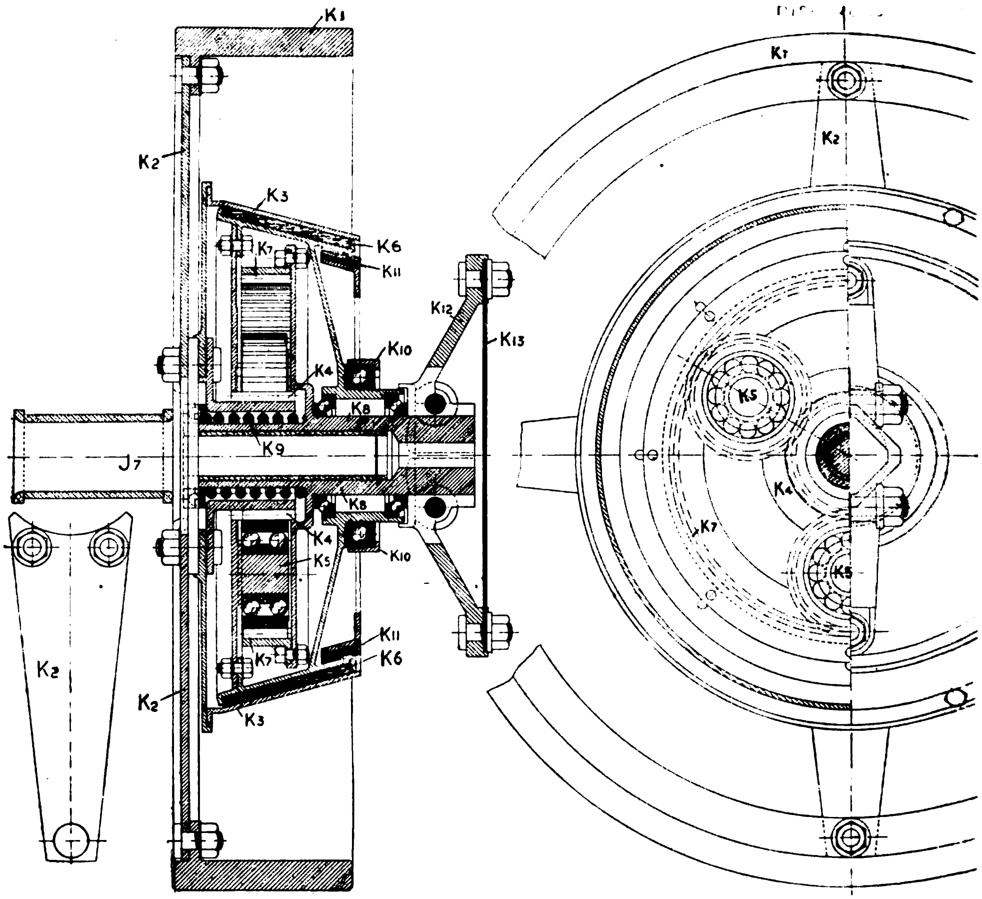


Fig. 4.—The Combined Flywheel, Main Clutch, and Reversing-Gear.

The change-speed-gear itself is of the sliding spur wheel type, and is controlled by a horizontal cam-plate which lies in the base of the box. The cam grooves are so cut that it is possible to pass round from the fourth to the first speed without having to go back through the third and second. Instead of using an ordinary side lever for changing the gear, a horizontal lever is mounted on the top of a vertical tube near the steering pillar, and the lever is arranged in such a way that it is used like a ratchet. It can be moved backward and forward without affecting the gear, and it has no definite position relatively to that of the spur-wheels which it causes to slide into mesh.

A powerful band-brake, of the metal to metal type, is fitted on the differential countershaft. Contrary to usual practice, it is operated by a side hand lever, and is only used in case of emergency. The brakes, which act direct on the hubs of the rear wheels, are those which are more ordinarily employed; they are of the expanding type in which a cam forces shoes against the inner face of the drum; they are simultaneously operated through Bowden wires from a foot pedal.

The steering gear is of the worm and worm-wheel type, and, as in the Napier design, which we described lately, is adjustable for back-lash in each direction. Special attention has also been given to the lubrication of the various parts, to the provision of expansion fittings in the water system, and to the shape and length of the pipes which lead the explosive mixture from the carburettor to the cylinders, the exhaust gases from the cylinders to the silencer, and the water to and from the jackets.

The Transmission-Gear.

In the finished car, from which our photographs were taken, the flywheel, K, is made of cast iron in the usual way, and it encloses the combined main clutch, which is of the ordinary cone type, and the reversing gear, which, as we have already said, consists of an epicyclic train of gear-wheels. In this model, the clutch is normally brought into engagement by the external spring, L^1, seen in Figs. 2 and 3, and is withdrawn by a forked lever which engages with a thrust-bearing ring, L. The male member of the clutch carries the planet-wheels, the sun pinion is fixed to the flywheel, and the internally toothed rack, with which the planets are also in mesh, is fixed to the first-motion shaft of the change-speed-gear. When the clutch is disengaged, the engine is free to revolve independently, and if the car is at rest, the male clutch member revolves independently. As the clutch is allowed to come into engagement, the male member is compelled to revolve at the same speed and in the same direction as the flywheel, and consequently the epicyclic gear is locked, and its wheels have no duties to perform. After withdrawing the clutch cone, and if the foot pedal is depressed still further, this male member of the clutch is brought back so that a friction surface formed on it comes into contact with two stationary brake blocks, L^2, which are fixed to the underframe. In this way it is prevented from revolving, and consequently the pins upon which the planet wheels revolve are also held stationary, with the result that a reverse motion is transmitted to the first-motion shaft, and the speed at which it is driven is considerably lower than that of the engine.

An improved design, having many interesting features, is shown in Fig. 4, this being the model for future cars. The flywheel, together with the main clutch and the reversing gear, is shown in section, and certain parts of it are also seen in front elevation. The flywheel itself is peculiar because it is built up with flexible steel spokes, instead of being cast in one piece. The necessary weight is provided in the rim, K^1, and this is carried by four flat steel arms, K^2, which are bolted to it, and are, at their other ends, secured to the crank-shaft, J^7. The object of this construction is to reduce the strains which are imposed upon the shaft by ordinary flywheels owing to gyroscopic action, by allowing the rim to self-centre itself—taking advantage of the springiness of the spokes.

The outer member, N^3, of the main clutch is bolted to the flywheel as shown, and the spur-wheel, K^4, is also fixed to it by the same bolts. The wheel, K^4, is so made that there is sufficient room inside it for the spring, K^9, which normally holds the male member, K^6, in contact with the outer cone member, K^3. The planet-wheels, which are three in number, and mesh with the wheel, K^4, are mounted upon ball bearings on pins, K^5, and these pins are fixed, in the manner shown, to the male member, K^6. The external rack, K^7, which is an internal-gear-wheel meshing with the three planets, is fixed to the sleeve, K^8, which revolves upon the end of the crank-shaft, and is connected through a special universal-joint (represented by K^{12} and K^{13}, and to be referred to again presently) with the first-motion shaft of the change-speed gear. It will be noticed that the clutch member, K^6, is mounted on ball bearings on the sleeve, K^8, and that when the clutch is disengaged, by forcing the member, K^6, inward against the action of the spring, K^9, that the sleeve, K^8, and therefore the toothed rack, K^7, also moves longitudinally with it. The clutch member, K^6, is moved in this manner by means of a forked lever which presses against the ball thrust bearing, K^{10}, when the pedal is depressed. A very small movement is of course necessary in order to disengage the clutch, and if a further movement is given to the pedal the inner cone face of the clutch member, K^6, is brought into contact with a stationary brake ring, K^{11}, which is fixed to the underframe, and thus the inner clutch member is prevented from revolving, and the epicyclic gear then gives the necessary reverse motion between the flywheel and the sleeve, K^8. The action of the clutch and the reversing gear is the same as on the existing car which we have already described.

(*To be continued.*)

The Vacuum Oil Company are certainly to be commended for the admirable little pamphlets which they from time to time issue on the important subject of lubrication. We have reviewed some of these admirable little booklets before, and we have now much pleasure in referring to another treatise which we have received from them, entitled "Oil and Power." It goes over much the same ground that has been covered by their other treatises, but it is impossible to repeat the leading conditions required to produce satisfactory lubrication too often, for it is quite astonishing to what an extent even among practical people they are inadequately appreciated or even neglected altogether. The present little work puts anyone who will be at the trouble to read it through in possession of all the main principles on which proper lubrication depends, the conditions which have to be fulfilled in slow running machinery with heavy load, and how the nature of the lubricant should vary when we have to deal with high-speed machinery. The treatise is illustrated throughout by thumbnail sketches of the different works and packing stations of the Company. It is a little treatise from which it is impossible to make any excerpts or quotations, for the simple reason that it is so condensed that to quote at all it would be necessary to quote it all.

Amongst the candidates for election at the Automobile Club this week were Prince T. Hadzfeldt, Sir A. Conan Doyle, Sir Robert J. Dashwood, Bart., K. S. Bahadur, Nawab of Dacca, the Rt. Hon. Viscount Churchill, G.C.V.O., the Hon. Rolfe A. Lubbock, the Hon. A. O. Murray, M.P., and Lieut. the Hon. Cyril A. Ward, R.N.

It is a sufficiently serious offence for a man in charge of a horse-drawn vehicle to render himself incapable of properly managing it by over-indulgence in intoxicating beverages, though very often on such occasions the "horse sense" of the more temperate quadruped saves the situation. This cannot occur in the case of a motor car, and to be under the influence of liquor when driving one is a correspondingly more serious offence. All automobilists will doubtless be glad that Mr. Garrett, at the South-Western Police Court, made an example (by the infliction of a month's imprisonment) of the driver Edward Nichols, who was arraigned before him on this charge, and for under the circumstances smashing up a hansom cab. Doubtless, also, everyone will agree with Mr. Garrett in saying that Nichols ought to consider himself extremely fortunate that he was not standing in the dock on a charge of manslaughter.

A PETROL CAR FITTED WITH VARIABLE SPEED FRICTION GEAR.

LAST week we described a gradually variable change-speed gear fitted to a petrol lurry of American design and construction, and we then remarked that the ratchet system of obtaining a gear having the desired characteristics was a very favourite one with inventors. Almost equally so has been the friction method of transmission, in which a pulley mounted on the driving shaft is brought into contact with a disc on the driven shaft, the parts being so arranged that the former can be moved inwards or outwards radially against the face of the latter. Several such devices have already been brought before the notice of our readers, but in general this system has not proved itself entirely successful, owing largely to the loss of power, which is due to the great pressure necessitated in order to force the driving pulley against the driven disc; the lateral strain on the driving-shaft, and usually the end strain on the other shaft also, are very severe, and have to be taken by the bearings. Although this drawback is common to all variable speed gears of this type, yet for light vehicles it is undoubtedly less serious, and may be found to answer in practice, provided that the parts are well designed and are well made.

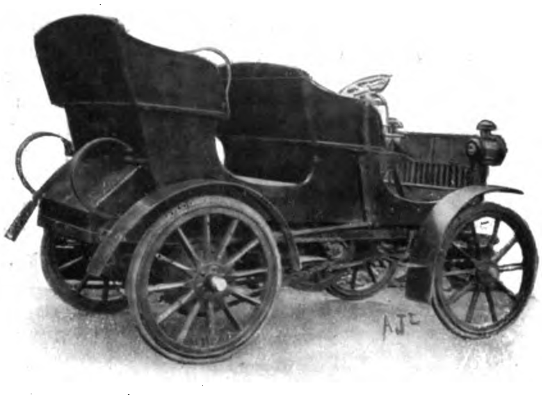


FIG. 1.—The Thomas Friction-Driven Petrol Car.

The latest instance which has come before our notice of the practical adoption of such a gear for automobiles is found on the experimental car shown in the accompanying illustrations, which has been designed and built by Mr. W. F. Thomas, of Inkerman Street, Birmingham. Fig. 1 shows the complete vehicle; Fig. 2 is a view from the rear, with the cover above the engine removed; and Fig. 3 shows the variable-speed-gear as it is seen from above when the flooring between the two seats is lifted out.

The engine has two cylinders, and develops about 8-h.p. The cylinders lie transversely across the car, the one (A) having its head near the frame on the left-hand side, and the other—which, being further forward, is not visible in Fig. 2—having its head near the right-hand side of the frame. The cylinder, A, operates the crank-shaft, B^1, and the other cylinder drives the shaft, B, the rear end of which passes beneath the cylinder, A. The two cylinders are placed at a slight angle upward from the horizontal and the one is in front of the other, so that the crank-shaft of the one can pass beneath the other. The cylinders have a bore of 3¾-inch, and the stroke is 4-inch.

Each crank-shaft carries a fly-wheel just in front of the engine, the wheel, C (Fig. 3), being on the crank-shaft, B, and the wheel, C^1, on the shaft, B^1. These fly-wheels overlap one another. They revolve at the same speed, but in opposite directions, to ensure which the two shafts are at their rear ends connected together by gearing, as seen in Fig. 2. The forward ends of the crank-shafts are provided with telescopic and universally-jointed shafts, which are mounted in ball-bearings and terminate at their forward ends in friction pullies having conical faces. The pulley, D, on the shaft, B, is seen in Fig. 3, and a similar pulley is also mounted on the other shaft. The bearings are so arranged that the friction pullies can be forced towards one another or can be forced apart, and provision is also made by which they can be moved longitudinally.

When brought towards one another they come into contact with conical surfaces, which constitute friction discs mounted on the countershaft. One of these friction-surfaces, E^1, is visible in Fig. 3, and the illustration makes it clear that they form the sides of the differential gear, E, on the countershaft. As the pulley wheels are fed inwards towards the centre of the countershaft, so its speed relatively to that of the engine is increased. Both the pulley-wheels tend to drive the countershaft in the same direction, and in this design no end-thrust is imposed on the counter-

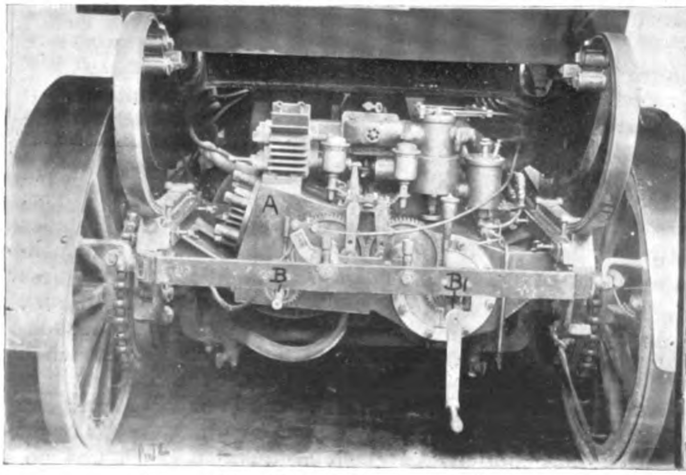


FIG. 2.—Rear View of Car, showing Engine.

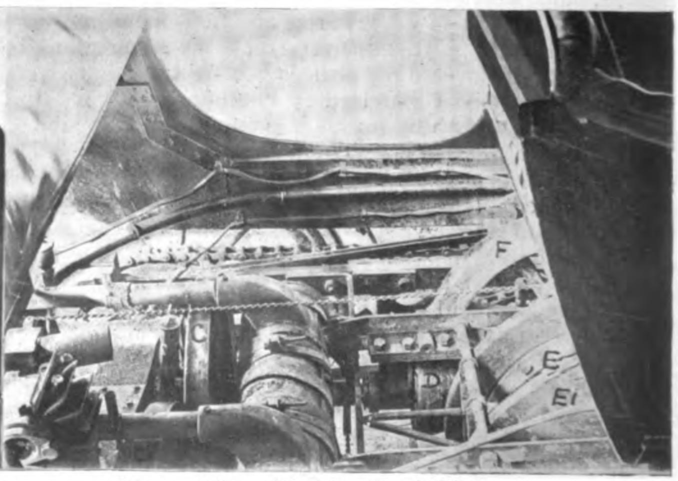


FIG. 3.—View of Variable-Speed Friction Gear.

shaft, because the two pullies are forced with equal pressure against the disc faces in opposite directions. The changes of speed can be made gradually, and the range which is available is considerable.

A "reverse" gear is provided in a similar manner. For bringing it into operation, the two friction pulleys are forced away from one another, so that the wheel, D, comes into contact with the cone-faced wheel, F, on the countershaft, and the other pulley is forced against a similar cone-face on the other end of the countershaft. A low-speed "reverse" is thus available.

The power is transmitted from the countershaft to the rear wheels in the usual way by side chains.

We understand that the experimental car has proved very satisfactory, and that Mr. Thomas is about to put a 10-h.p. vehicle, and a 6.h.p. voiturette, on the market. The former will have a twin-cylinder engine of the same form as that which we have described, but it will be placed beneath a bonnet in front instead of being fixed behind. The smaller vehicle is to have a single cylinder engine, giving 6-h.p. at 800 revs. per min.

SKINDLE'S HOTEL, Maidenhead, has come into line with the automobile movement. At this popular and well-known riverside hostelry, the Farman Automobile Company, Limited, have opened a large garage, in which there is a complete repair shop, and where all accessories can be procured. A system of hiring out cars by first-class makers has been inaugurated, and this garage is only one of a series which the firm intend to open shortly upon the same lines in different holiday centres. The Company, which is now under the Managing-Directorship of Mr. A. Pereno, is displaying considerable activity in establishing depôts of this nature in districts where automobilists most do congregate, and where experienced mechanics at times are a positive necessity.

THE last draft of the Automobile Club Bill, with which we dealt last week, has been the occasion of a number of quite unusually banal jibes on the part of writers in the daily Press, more particularly in the provinces. Certain journalists seem to be particularly exasperated by any suggestion that the speed limit should be removed, though a number of them are only too anxious to saddle the automobile with the necessity of carrying numbers. One of these worthies, in the *Yorkshire Post*, is particularly indignant at the suggestion that the imposition of numbers should be looked upon as a return for the removal of the speed limit, and remarks that

> Every week farmers and tradesmen appear before the magistrates and are subjected to penalties for neglecting to have their names and addresses painted legibly on vehicles; we do not remember that they dictated the terms on which they allowed this obligation to be placed upon them.

The farmers and others, however, have got a very good return in this case. The return is exemption from paying a vehicle tax, and they are not summoned for not having their names on their carts or carriages, but for having carts not provided with names and for not paying the yearly tax upon them. This sort of thing is a very fair example of the style of argument generally employed. However, as we have said before, exaggeration and misrepresentation defeat their own ends, and there will be a reaction before very long.

PARIS-MADRID.

WE have received from Mr. Charles Jarrott a *resumé* of his experiences over the Paris-Bordeaux course, which we publish below. Although the description brings forward no further facts, the impressions of this eventful race upon the mind of Mr. Jarrott are extremely interesting.

Mr. Jarrott writes us as follows:—

In endeavouring to give some short account of my experiences in the Paris-Madrid, I perhaps ought, firstly, to say something in regard to my troubles prior to the race.

The De Dietrich car which I was to conduct was put together and everything seemed to be in perfect condition until it came to the scales to be weighed, when it was found that a miscalculation had been made and that the car was considerably over the 1,000 kilogs. limit. Everything was done to bring the weight down but unsuccessfully, and at the last moment a new engine of considerably less horsepower had to be fitted. I may say that this new engine had been put through as a safeguard in the event of the weight being too heavy. The additional advantages we obtained here, however, were that much stronger axles and much stronger springs were fitted, as the weight saved in the smaller motor was very considerable, and we decided that, in view of the bad roads in Spain, it might be a better policy to build a carriage to stand the fearful strains it would have to undergo on the Spanish roads than a merely high-speed machine.

However the car had to be brought by train from Luneville without having been run, in order to be ready for the weighing on the Tuesday morning prior to the race, and although I drove it back to the garage in Paris it had nevertheless to come to pieces entirely to allow of a number of things being done which time had not permitted the Works to carry out.

On the Thursday prior to the race I managed to get a short run of about 20 kilometres, and found that I required several things altered, which were accordingly started. The net result of these delays was that at 7 o'clock on Saturday evening (eve of the race) I took my car out of the garage for a run half-way to Versailles and back, to see that everything was working satisfactorily. It was fitted with three speeds, but I did not get an opportunity of using the top speed at all, and only managed a run of a little distance on the second, so that when I started off for Bordeaux on the Sunday morning I had never been on the top speed of my car.

The imperturbable Stead, the genial Loraine Barrow and myself started off late on Saturday evening to Versailles and stayed at the Hotel des Reservoirs, where, after dinner, we managed to secure three hours' sleep before the start. At two o'clock I was awakened by Barrow, and I must confess that at the particular moment of my awakening I would cheerfully have resigned going to Madrid or anywhere else, if only I could have had another three or four hours' sleep. The only food to be obtained was a cup of chocolate and a roll in the coffee-room of the hotel, and there one found most of the prominent competitors in the race, chaffing and joking as to the capabilities of each other's machines and the prospects of each individual finishing.

Accompanying me in the race was my mechanician, Bianchi, who has been with me in most of my drives in England, including the Reliability Trials and the Glasgow to London Non-Stop Run, but has never accompanied me in a Continental race before. Not being able to speak French handicapped him somewhat, as, although he has a foreign name, he is essentially British, and one of the strongest points I noticed about him was that he always seemed to be able to get what he wanted.

My first difficulty was on leaving the hotel, when I did not know which direction to take for the start. It was quite dark, and I wandered round a number of streets until I struck the familiar line of cyclists with their multi-coloured lamps, and these I followed until I found myself up against the line of cars. My car seemed to be running all right, at least the engine did not stop after I left the hotel.

Making my way to the front of the line (in view of the position I held, being No. 1), I found there many friends and a huge bundle of telegrams from England wishing me the best of luck and a safe journey, and I would here like to thank those one and all who wired me their kind expressions, many of which I have been unable to acknowledge.

3.30 came, and it was decided to give us another quarter of an hour, in view of the fact that it was then much too dark.

Fournier, De Knyff, and a number of French competitors came up, shook hands, and wished me luck, and I may say that from beginning to end of the race my reception right through was better than any I have ever experienced before in any race in France. Being an Englishman in competition in France is evidently not such a handicap as it used to be.

Thousands and thousands of people, cyclists and motor cars assisted in the composition of as weird a scene as one could possibly imagine. 3.45. On with the switch and away went the motor. "Five," "four," "three," "two," "one," "Go!" and the race had started. Perhaps at this point my own personal ideas may be of interest. I had noticed that when I start in an easy going fashion, not feeling particularly keen, I seem to do best. and in view of the fact that I had to get to Madrid, and that Paris-Bordeaux was only one stage, I had no intention of hurrying, but at the same time I had made up my mind to get to Madrid with my car.

Another note of explanation is in regard to my knowledge of the road. I had previously been as far as Ruffec, the other side of Tours, but as I did not join the road until I got to Chartres, the only portion of the road I had been over at all was from Chartres to Ruffec.

The first corner at Versailles nearly led me astray. At the last moment I perceived that to turn to the left was the correct road, and here I had what one might term my "nearest squeak." I was travelling very fast, saw I could just make the turn, and took it successfully. The people blocked the road in one dense mass, but my previous experience in motor racing told me that they invariably cleared at the last moment, leaving an opening through which the car was to pass. Although I suppose it is rather inclined to try one's nerves to be obliged to drive at about 60 or 70 miles an hour at a dense mass of people, nevertheless it has to be done, and unless one is prepared to do this, time is being lost. It makes very little difference to the crowd whether the car is going at 40 or 70 miles an hour. They leave it to the last moment before making way, and as much damage can be done at 40 miles an hour as at 70.

I was not pushing my car in view of the fact that it was its first run, and had taken things quite steadily when 15 to 20 kilometres from the start De Knyff passed me and raised an enormous cloud of dust. This brightened me up a little and I hung on to his heels for some time although I was not extending my car in the slightest degree.

Then Louis Renault came up and passed me, and at the second control he was leading, De Knyff second and myself third. Soon afterwards Werner appeared on the Mercedes and went by at a very fast speed. Then my engine took to miss-firing and eventually almost stopped. From the sound I located it as lack of petrol, and jumping down, disconnected the pipes from the carburettor to the tap, and the tap to the tank, and found that the stoppage was in the tank itself. Clearing this with wire I replaced the pipes, got the engine running again, and started off.

On and away to Tours—the road was good and I was pushing the car along to its utmost speed. My delay had enabled Louis Renault to gain on me very considerably, and at Tours I was 35 minutes behind. Werner was just leaving the control as I appeared and was, I should think, five minutes in front of me.

A grand run to Ruffec—in which I felt I was making up for lost time—was the next incident, and then I saw Werner's carriage smashed to pieces on the right side of the road, something having apparently happened to his back axle. Seeing that neither Werner nor his mechanician were hurt I did not stop.

Just before reaching Ruffec my engine took to running on three cylinders. I immediately stopped, found that I had a broken magneto plate, and had therefore to take the bonnet off and fit a new plate. The fitting of this on the side of the cylinder (the engine being fearfully hot) took me longer than would have been the case had I been doing the work with the engine cool and everything to hand.

Away we went, and again the engine dropped on to three cylinders, and this time I discovered that a small spring on one of the jumpers had broken. This also I had to replace, again having the trouble of handling parts which it was almost impossible to touch owing to the heat. Off once more for 20 kiloms., when the engine again began to run on three cylinders. I stopped and removed the bonnet of the motor, but seeing nothing wrong decided to push on, hoping for the best. Starting the engine I found that the cause of the trouble (whatever that had been) had been removed, and we were on four cylinders, the engine pulling grandly.

From here onwards we had not the slightest trouble of any description. I may say in addition to the four stops already mentioned I stopped twice to take petrol and water, so that in the run through I had six stoppages.

The road twists very much after Angoulême, and it was on this portion of the road that most of the unfortunate accidents took place, Stead, Loraine Barrow, Mayhew, Tourand, Georges Richard, and a number of others all coming to grief. This part of the journey, however, so far as my own performance was concerned, was the best. In spite of the corners, we managed to average over 60 miles an hour, although I was afraid that any chance of catching Louis Renault was lost.

He had started from Angoulême 35 minutes in front of myself; it seemed hopeless to endeavour to pick this up. However, we wiped out his advantage to the extent of 20 minutes, and finished in Bordeaux exactly 15 minutes after him, accomplishing the distance in 5 hours 51 minutes.

That I had a number of difficulties to contend with will be understood when I mention that the car itself was absolutely untried, and that I was driving in a position I had never driven in before, namely, sitting about 6 inches above the floor of the car with my legs stretched straight out before me and the steering wheel low down—enabling me to keep out of the wind—instead of in the orthodox fashion.

My De Dietrich certainly finished in splendid condition for the run on to Madrid, and I feel sure that with the advantages I possessed, viz., strong axles and springs, I would have been able to have made some very good running on the rough Spanish roads.

Gabriel's performance was remarkable, as apart from the fact that he had a very fast car, he must have driven magnificently to have finished in the time in which he did.

It was certainly pleasant to find at the control at Bordeaux so many English faces, and to feel that after all the stirring experiences of the road one was once more among one's own countrymen and friends. Of course, then, I did not know anything of the accidents which had happened behind me, as no one had any knowledge of what had taken place.

It was a hard race and a fast race, and to finish up in front of all the cars, with the exception of the Mors, and in front of the Panhards and Mercedes which had been so much dreaded at the start, was certainly a very great satisfaction to me.

The prohibition of the race was probably the wisest course, although there was in the decision an element of locking the stable door when the horse was gone. Had some discretion been shown by the French Club in the first instance by limiting the number of entries and refusing to let novices start on high-powered carriages, much of the trouble would have been averted, although, in the case of Renault, Stead, and Loraine Barrow, they were all experienced racing men who knew the game thoroughly. Regarding the case of M. Renault I can say nothing. He was evidently driving with the idea that all the arrangements for the road were perfect, instead of relying on his own judgment.

Arrangements may be quite perfect in regard to dangerous points, but at the same time it is far better to drive as if there were no warning flags. It may mean slower time, but it is much safer. Marcel Renault was taking one of the risks which one has to take dozens of times in motor-racing, and in deploring the accident it is with a feeling of deepest regret that one of the best of French chauffeurs has died playing the game.

The accident to Loraine Barrow and the accident to Stead, I personally investigated two days afterwards when I drove from Bordeaux to Libourne. From the evidence of bystanders who saw the accident there is no question but that Barrow was endeavouring to avoid a mix up between two dogs that were on the road, cut things too fine, was unable to get back on to the road again and struck the tree. The force of the blow was so terrible that the right-hand front-spring hanger was driven into the tree right up to the frame. It is unnecessary to enter into details, but had I not seen it I should never have imagined the effect. The way in which the car was smashed to small fragments was appalling, the motor itself being torn out of the car and thrown at least 15 to 20 yards away.*

Farther down the road we saw Stead's carriage upside down, and I may say he owed his life to the fact that he fell practically into a ditch, over which the car, forming a bridge, was held off his body. He was severely knocked about, however, and the speed lever pinched him very badly. I saw him in the hospital at Libourne, and he made a statement that he had been cut by another competitor. The right-hand wheels of his car certainly showed signs of collision with what I should imagine to be the hub of another car. The effect was disastrous, and I marvel that he and his mechanician escaped. Stead, when I saw him, was progressing very well indeed, and I hope he will be about in the course of two or three weeks. The condition of Barrow, who is in the same hospital, is not as good.

The final scene of what one may term the Paris-Madrid fiasco was when the cars were escorted from the Exhibition to the station by armed police, the order having gone out from the Prefect that no one was to be allowed to drive them away, and that they would have to go back to Paris by train.

That motor racing on these lines is finished in France there can be no question, but that it is killed absolutely I do not think. The French realise (and this opinion was expressed by M. Combes in the Chamber of Deputies in the discussion which took place in regard to the race) that motor racing has been an invaluable aid to France in the building up of the automobile industry in that country, and it will be a serious blow to the industry in that country if racing *is* finished, though, if not, it will certainly have to be run on different lines.

Restricted cylinder capacity with a minimum weight will put before the constructors problems in regard to efficiency and strength which cannot but have a marvellous effect on the evolution of motor carriages sold for ordinary use commercially, which, after all, is the real object of racing. That it is sporting there can be no question, but 120-h.p. is not necessary for sport, and I myself should derive as much pleasure in driving a racing vehicle of from 12-h.p. to 20-h.p. as one of 100-h.p., provided the rest of the competitors were on equal-powered vehicles.

THE Spanish Automobile Club have decided to present Gabriel with the prize cup which was offered, in connection with the Paris-Madrid Race, to the competitor covering the distance in the shortest time. This sportsmanlike behaviour of the Spanish Club will, without doubt, meet with the approval of the automobile world generally, and the Mors Company in particular, who are to be congratulated on their good fortune.

Official notification has been given by the A.C. de F. that in consequence of the race having terminated at Bordeaux, they do not intend to recognise any classification of the cars engaged, either singly or the cars which were entered in groups of four. One reason for this being given that the cars were not weighed when they arrived at Bordeaux. The prize of the town of Bordeaux for the best time from Paris to that city has been awarded to Gabriel, and the Coupe d'Arenberg offered to vehicles using alcohol as a fuel is awarded to the Gobron Brillié Company, whose car, driven by M. Rigolly, arrived in the best time, for cars using alcohol, of 7 hrs. 44 mins.

The French Club have issued the times as officially taken for the various vehicles that completed the course to Bordeaux. These differ in a very small degree, except in three or four cases, from the table as given by us originally, but for the purposes of record we now give the complete list afresh for each of the classes.

The classing by categories is as follows :—

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* An illustration of this appeared in our last week's issue.—ED.

HEAVY CARS.

		h.	m.	s.
1	Gabriel (Mors) 168	5	14	31⅕
2	Salleron (Mors) 96	5	47	1⅘
3	Jarrott (De Dietrich) 1	5	52	55
4	De Crawhez (Panhard) 78	5	54	11⅗
5	Warden (Mercedes) 99	5	55	30⅘
6	Voigt (C.G.V.) 153	5	57	49⅕
7	Gasteaux (Mercedes) 293	6	1	16
8	A. Fournier (Mors) 203	6	12	39
9	Rougier (Turcat-Mery) 69	6	17	7⅘
10	Mouter (De Dietrich) 112	6	18	54⅕
11	Jenatzy (Mercedes) 86	6	25	8⅗
12	Max (Mercedes) 155	6	38	35⅕
13	Augières (Mors) 185	6	43	49⅗
14	Le Blon (Serpollet) 119	6	44	15⅘
15	Berteaux (Panhard) 116	6	47	55
16	Braun (Mercedes) 292	7	5	4⅗
17	Chanliaud (Serpollet) 90	7	7	38⅖
18	Teste (Panhard) 10	7	13	8⅗
19	Lavergne (Mors) 195	7	22	49
20	De Caters (Mercedes) 27	7	33	48⅖
21	Rigolly (Gobron-Brillié) 219	7	44	8⅘
22	Kohler (Mercedes) 39	8	5	50⅘
23	Lamberjack (Panhard) 150	8	0	14⅕
24	Guders (Pipe) 94...	8	13	26⅖
25	De Brou (De Dietrich) 85	8	3	50⅗
26	Langlois (Panhard) 106	8	6	47⅘
27	Van de Poële (Pipe) 126	8	25	6⅘
28	Barbaroux (Benz) 33	8	36	44
29	Giraud (C.G.V.) 218	8	38	45⅕
30	Chenu (Chenu) 253	8	52	49⅘
31	Gavaris (Panhard) 248	9	6	32⅕
32	Charron (C.G.V.) 53	9	16	52⅗
33	D'Udekem (Serpollet) 204	9	21	46⅗
34	Hieronymus (Mercedes) 36	9	31	45
35	Duray (Gobron-Brillié) 225	9	41	1
36	Durand (Mors) 278	9	50	42⅖
37	Van der Eyden (Panhard) 158	9	51	12⅕
38	Turr (Panhard) 52	9	57	18⅗
39	Degrais (Mercedes) 34	10	3	40⅖
40	Lafont (De Dietrich) 196	10	12	26⅕
41	Ollivier (Serpollet) 201	10	16	10⅗
42	Caillois (Serpollet) 175	10	26	27⅗
43	Holder (Holder) 227	10	32	2⅕
44	Kœchlin (Gobron-Brillié) 82	10	33	4
45	Mme. du Gast (De Dietrich) 29	10	51	7⅖
46	Beutler (De Dietrich) 231	11	21	45
47	Comiot (C.G.V.) 50	11	27	22
48	Gasté (Automotrice) 46	11	46	10
49	Stéphen Ribes (Panhard) 55	12	53	16⅖
50	Amblard (Mors) 217	13	40	20
51	Lillie (Serpollet) 282	14	43	2
52	Rulot (Serpollet) 121	20	58	4

The numbers after the names of the cars are the official numbers under which the vehicles ran.

LIGHT CARS.

		h.	m.	s.
1	L. Renault (Renault frères) 3	5	29	39⅕
2	Baras (Darracq) 47	6	13	20⅘
3	Page (Decauville) 209	6	20	8⅕
4	Hemery (Darracq) 128	6	56	53⅕
5	Pellisson (De Dion-Bouton) 111	7	13	42⅖
6	Théry (Decauville) 4	7	24	16
7	Edmond (Darracq) 103	7	52	24⅕
8	Sincholle (Darracq) 173	8	5	7⅗
9	Bardin (De Dion-Bouton) 81	8	26	13⅗
10	Osmont (Darracq) 151	8	30	40⅖
11	Vilain (Prunel) 271	8	38	38⅕
12	Rasson (Clement) 233	8	47	52⅖
13	Valentin (Ader) 16	8	51	53⅘
14	Simon (Ader) 19...	8	55	17⅖
15	Loste (C.G.V.) 182	9	14	25
16	Vessin (Motobloc) 272	9	39	47
17	D'Hespel (d'Hespel) 262	9	46	25
18	Storero (Fiat) 44...	10	46	8
19	Dombret (Motobloc) 274	10	58	19⅕
20	Dernier (Clement) 232	11	33	23⅘
21	Deniot (Henriod) 102	12	23	33⅖
22	Davaud (P. Lambert) 300	12	25	40
23	Persan (Corre) 263	12	32	32
24	Quinzeaut (Ader) 28	12	35	19⅕
25	Pagliano (P. Lambert) 299	13	27	40
26	Dombret (Motobloc) 273	14	9	42

VOITURETTES.

		h.	m.	s.
1	Masson (Clément) 37	7	14	45⅕
2	Barillier (Richard-Brazier) 143	7	40	0⅗
3	Wagner (Darracq) 65	7	48	12⅖
4	Comber (Richard-Brazier) 148	8	8	26⅘

		h.	m.	s.
5	Holley (De Dion Bouton) 57	8	23	19
6	Maurice Fournier (Clement) 88	8	26	32
7	Birnbaum (Ader) 130	8	26	50⅕
8	Legras (Passy-Thellier) 32	8	26	56⅕
9	Villemain (Darracq) 77	8	43	7⅘
10	Weisser (De Dion Bouton) 187	8	43	32⅖
11	Sommier (Ader) 140	9	0	30⅖
12	Corre (Corre) 31 ...	9	21	50⅖
13	D'Houdeauville (Passy-Thellier) 131	9	25	31⅖
14	Gautier (Ader) 200	10	25	26⅖
15	Maillard (Richard-Brazier) 192	10	57	43⅘
16	Aaron (Corre) 223	11	23	22⅕
17	Leberte (De Dion Bouton) 15	11	51	59
18	Flouret (Flouret) 276	11	56	50
19	De Boisse (De Boisse) 226	12	0	55
20	D'Aubignon (Ader) 73	13	5	24
21	Dupeux (Boisse) 307	16	18	10

MOTOR BICYCLES.

		h.	m.	s.
1	Bucquet (Werner) 42	8	56	55
2	Demester (Griffon) 132	9	4	44⅘
3	Jollivet (Griffon) 179	9	26	54⅗
4	Cissac (Peugeot) 203	9	40	36⅕
5	Lanfranchi (Peugeot) 181	9	45	31
6	Derny (Clément) 104	10	21	8
7	Griet (Griffon) 230	10	44	46⅕
8	Momo (Peugeot) 58	11	4	20⅗
9	Maillard (Werner) 286	11	11	18
10	Prost (Doué) 257...	11	43	5
11	Arnott (Werner) 84	12	6	2
12	Martel (Griffon) 297	13	12	2
13	Baret, Mot. Bruneau 170	14	36	30
14	Couderc (Peugeot) 260	16	53	44
15	Vaurs (Vaurs) 296	20	1	22

AN alcohol motor traction train for the use of the German troops in South West Africa has been recently experimented with by the German military authorities. It is intended to transport not only military material, but also Colonial and agricultural products. The motor can take a load of 20 tons, the transport of which would otherwise need twenty 2-horse vans covering a distance of 660 feet, the motor train only covering 60 feet.

IT would appear that a nice little game has been for some time played by so-called American "tourists," who have driven into Canada with their automobiles ostensibly on pleasure trips. The authorities, however, have been unable, in the majority of cases, to trace the return of the vehicles, and it has transpired that the cars have been sold in Canada, and the payment of duty thus avoided. As a result an order has now been issued by the Canadian Customs officials whereby the most stringent measures have been adopted, and under no circumstances are cars now allowed to cross the Canadian frontier without payment, in full, of the 25 per cent. duty on the assessment of the car.

LAST week, by way of pointing a moral on the *Daily Telegraph* "juggernaut" correspondence, we stated that one dog driven over by an automobilist would turn a whole village into anti-automobilists, and we for that reason advised cultivation of thoughtfulness in this direction. We deal elsewhere with an occurrence which conspicuously proves the truth of our assertion, and now, curiously enough, from America comes a further striking instance in support of our contention. At Lyons (N.Y.), a car ran over and killed a little dog some time back, and the inhabitants have since been so adverse to automobiles, that when one of their number, a wealthy grocer, procured a new Winton car, they unanimously decided to withdraw their custom from his shop, with the result that he was compelled to sell the machine.

Charles Jarrott and Letts, Limited—The "Firm."

CHARLES JARROTT AND LETTS (LIMITED).

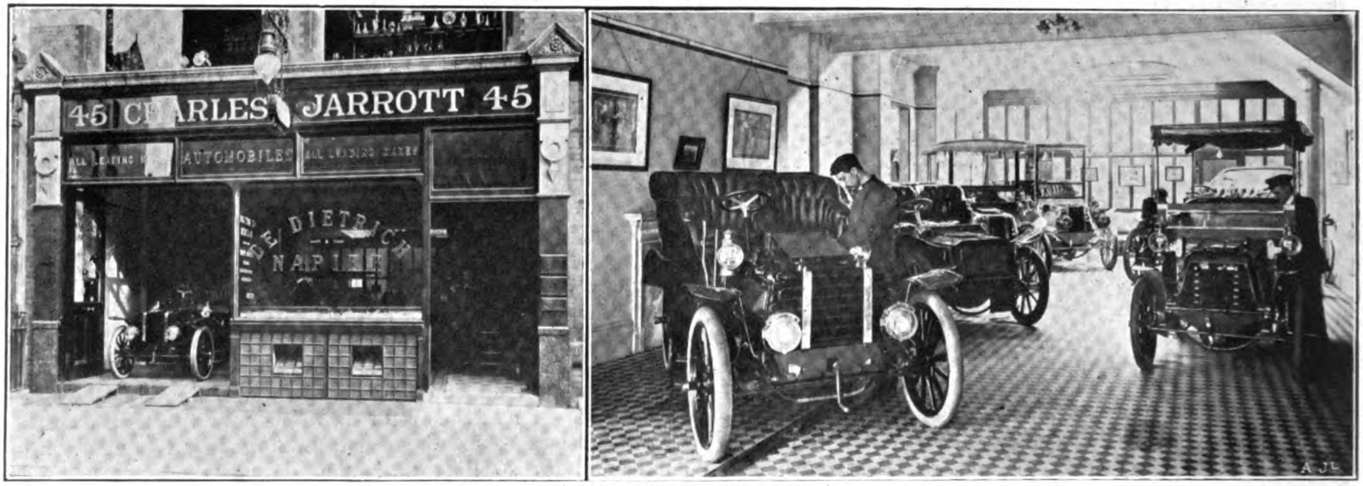
AMONG the many alterations and rearrangements which characterise the motor car industry at present, we have this week to chronicle the fact that Mr. W. M. Letts, so well known in connection with the Locomobile Company, has joined Mr. Charles Jarrott in the business which the latter gentleman founded about a year ago at 45, Great Marlborough Street, the title of the new amalgamation being Charles Jarrott and Letts (Limited). No two people could be better equipped for the development of a business of this kind than Mr. Jarrott and Mr. Letts. The experience of each of them, unique in its way, is supplementary one to the other. No one could have had a more valuable business experience or have displayed greater commercial ability than Mr. Letts in literally creating the English business of the Locomobile Company. Mr. Jarrott's principal gifts, as everybody knows, lie in a somewhat different direction. He is above all a practical man with unrivalled experience on the road.

Mr. Jarrott and Mr. Letts will thus combine just the very class of experience and knowledge which enables its possessors to grasp all the points of any new car which they may contemplate taking up the agency for, to form a reliable opinion as to what its capabilities in practice are likely to be, and above all, to be able to feel the pulse of the public and judge competently what is likely to be in demand in the immediate future. This capacity both to judge of the value of new types of vehicle and to be capable of thoroughly overhauling and testing existing vehicles is one of the rarest things to encounter in practical life. A great many people imagine that they have it, but few really possess it. It is only lengthy experience, such as that which has been enjoyed by those who have been in the motor industry from its commencement, that really enables reliable judgments of this kind to be formed.

No better evidence could be asked for of the present satisfactory position of the motor car industry and of its certainty to increase rapidly in the near future than that two men, who have had for so long unrivalled opportunities of judging what it is likely to become, should be willing to risk embarking their own capital and devoting their whole time and energy to such an undertaking. Messrs. Jarrott and Letts will employ their considerable energies in pushing the sale of Napier cars, for which they are special London agents, while another strong feature of their business will be the De Dietrich cars, for which they are the sole concessionaires in this country—not, however, that they intend confining themselves entirely to these well-known makes of car, for their undertaking will deal with vehicles of all such types as their customers demand, and they contemplate at an early date also putting a number of light and cheap American petrol runabouts on the market.

To most of our readers, of course, the life and doings, both of Mr. Jarrott and Mr. Letts, are familiar in all their details, but for any whose interest in automobilism may happen to be comparatively recent, we would append the following short account of their connection with the industry:—

Both Mr. Jarrott and Mr. Letts have been associated with the automobile industry from its practical commencement in this country, and were both at one time connected with one of the companies first formed to exploit the possibilities of the new locomotion. Mr. Jarrott himself at first intended to adopt the law as his profession, and he had been, for some length of time after leaving Cambridge, reading for that purpose, when in 1896 he grasped the enormous future which lay before the motor industry, and accepted a position with the British Motor Company, ultimately becoming secretary and subsequently manager. This position he resigned in 1900, and went to America, where, for some time, he controlled a large business of which automobile manufacture formed only one of the branches. Mr. Jarrott, however, did not appear to find himself fully at home anywhere but in his native country, and in 1901 he returned to England, from which date his history has, to a very large extent, been the history of the automobile movement in this country, and to a large extent on the Continent also. It was in 1901 that he undertook the organisation of the English De Dion Bouton business, afterwards assuming the control and management of the Panhard and Levassor business in this country for Mr. Harvey du Cros. Both these businesses have proved signally successful, and the admirable way in which they have been managed form the best possible testimonial to Mr. Jarrott's business capacity, and promise that the enterprise upon which he has now entered is likely to be crowned with the greatest success. Since the year 1901 Mr. Jarrott has, as everyone is aware, been one of the pluckiest and most successful drivers both of motor cars and of the less pretentious, but not less exciting, motor cycle. The number of prizes he has carried off both with motor cycles and, before that, as a bicycle rider is phenomenal, though, we believe, he regards his performance in the Circuit des Ardennes of last year as his crowning and most difficult exploit—perhaps, he would have beaten even that record had the Paris-Madrid Race not met with such an abrupt termination. His personal experiences in this latest event, which we publish in another column, give a wonderfully fresh and vivid picture of what driving in a great race must be like. The De Dietrich car on which he was running was doing better with every mile, and, though light powered, was of quite exceptional strength of construction. Mr. Jarrott's interests, although at present mainly absorbed by automobilism, are not by any means confined to that sphere, for he is in every way an all-round sportsman. He is a good shot, a light hand with the fly, and devotes a good deal of his spare time in the winter, when he has any, to the gun. He has ridden in a couple of steeplechases, and besides the trophies to which we have already referred is the possessor of prizes for swimming and running

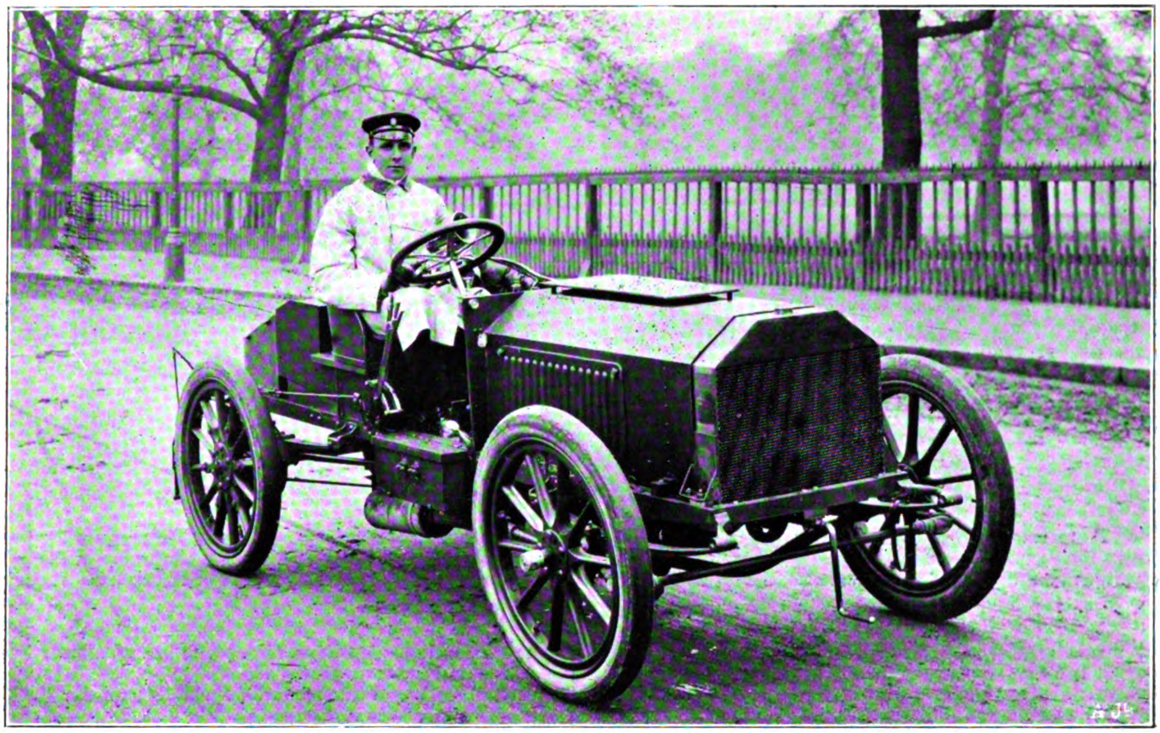


Charles Jarrott and Letts, Limited. The Firm's Premises and Showroom in Great Marlborough Street.

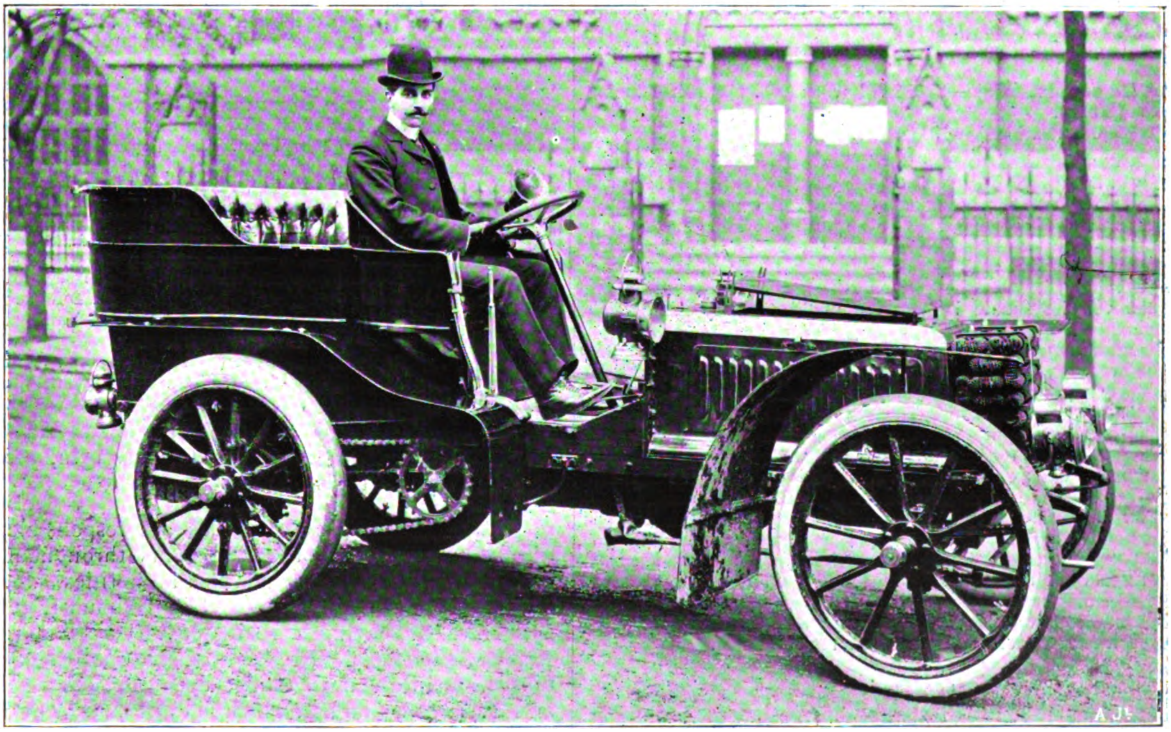
Mr Jarrott is now in Ireland studying the G.-B. course.

Mr. Letts' record is equally closely bound up with the progress of automobilism in this country. In fact the energy and business capacity which he has brought to bear on the popularisation of the light steam car has done as much as anything, and, perhaps, more than most, to popularise the automobile in this country. Certainly the Locomobile under his control and management did yeoman service in overcoming the prejudice entertained against the new locomotion in its early days, particularly in the country districts. Many were the people whose prejudices were removed by finding that cars were procurable which made no noise or smell, and which could be easily driven and controlled. Now that the petrol car has been improved to its present state of excellence, many of these same people have betaken themselves to more powerful vehicles of that class, so that of Mr. Letts' early clients not a few are now driving powerful and expensive petrol vehicles. Amongst other well-known automobilists whom Mr. Letts was the first to initiate into the pleasures of motoring were Mr. Leo Strachy and Mr. Rudyard Kipling, both of whom continue ardent motorists to the present.

Mr. Letts has been connected with the automobile movement for almost the same length of time as Mr. Jarrott, and the first car he drove was in 1897, when he made his first practical acquaintance with automobilism on a belt-driven Cannstatt Daimler car which could attain the giddy speed of about 15 miles an hour, and had the distinction of being one of the best hill climbers of its day. In 1898 Mr. Letts became manager of the Coupé Company, and about the same time as Mr. Jarrott, viz., in 1900, he made his first trip to America, which resulted in his organising and ultimately conducting the English branch of the Locomobile Company, which has been under his management such a wonderful success. In fact, since he took up the management of the Company in 1901, he has sold very little short of 1,000 of these light steam cars in this country. The small amount of leisure that his enormously busy life leaves him Mr. Letts devotes to cricket, at which he is a proficient, and to dog fancying, with terriers as a speciality.

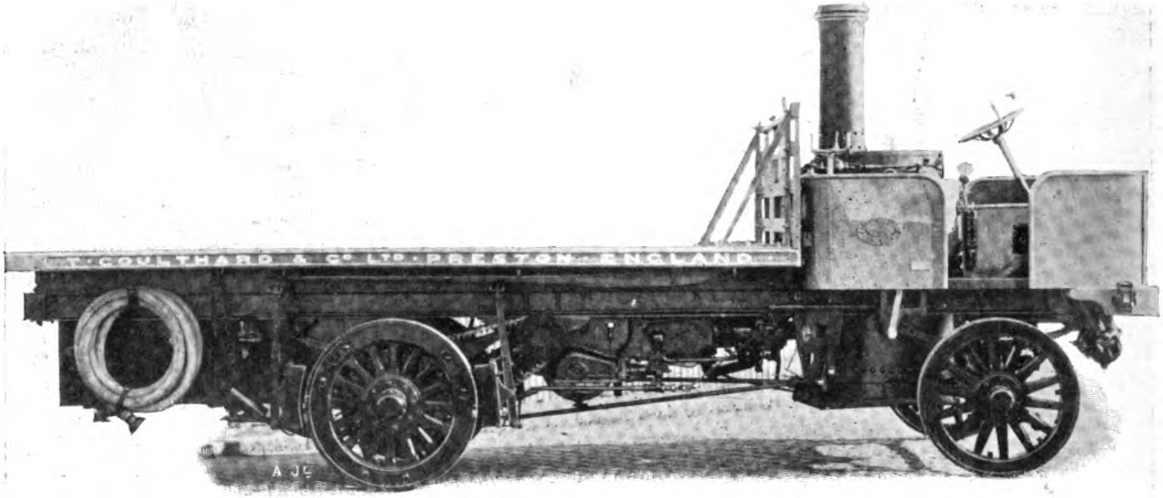


Mr. Charles Jarrott on his Napier Car. One of the special makes which the Firm will deal in.



Mr. W. M. Letts on a De Dietrich Car, the other leading feature of the new Firm. It was a De Dietrich Car on which Mr. Jarrott did so well in the Paris-Bordeaux Section of the Madrid Race.

RACES, RECORDS, AND TRIALS.



A.C. of America Trials.—The Coulthard Lurry just prior to its shipment to America. This vehicle has gained a Gold Medal in the recent New York Commercial Vehicle Trials and was entered by the John Simmons Company of New York. The weight of the vehicle with water and fuel is 14,225 lbs., and in the Trials it carried a load of 10,000 lbs. Its carrying capacity is, however, 14,000 lbs.

A.C. of America Commercial Vehicle Trials.—These trials, which occupied two days, on May 20th and 21st, brought forward 11 competitors, viz., 4 petrol delivery vans and trucks, 6 steam vehicles, and 1 Waverley electric van. There were six classes according to "dead load" carried, the entries being—

CLASS 1 (750 lbs. load).—Waverley electric van (No. 5); Mobile delivery van (No. 10).

CLASS 2 (1,500 lbs. load).—Knox open delivery van (No. 11); Knox covered delivery van (No. 12); Blaisdell covered delivery van (No. 14).

CLASS 3 (3,500 lbs. load).—Union stage truck (No. 2); Union baggage express (No. 3).

CLASS 4 (6,000 lbs. load).—Herschmann truck (No. 7); Morgan truck (No. 9).

CLASS 5 (10,000 lbs. load).—Coulthard truck (No. 1); Herschmann truck (No. 6).

CLASS 6 (20,000 lbs. load).—No entries.

Classes 1, 2, and 3 had to cover 40 miles each day in three stages respectively of 20, 10, and 10 miles. Classes 4, 5, and 6 had 30 miles to cover each day, in two stages of 20 and 10 miles. A compulsory stop of 10 minutes at the end of each stage was specified. The first day was to be a non-stop run, other than the stage stops, and on the second day the following stops had to be made:—Classes 1 and 2, 100 stops; Class 3, 50 stops; Class 4, 25 stops; and Class 5, 10 stops. The idea was that the vehicles should be working under ordinary commercial conditions.

The Herschmann truck (No. 6) was the first to fall out about halfway on the first day, the trouble being a leaky boiler. The Blaisdell van (No. 14) caught fire on the first stage and retired from the contest. On the second day the two Union trucks were put out of the running, No. 2 bending its crank-pin on the first stage of the second day, when endeavouring to reverse too quickly. No. 3 had a tyre come off about the same time, an upset on Broadway placing this car out of the contest. All the other starters got through, in most cases with considerable credit, so far as can be judged from unofficial data. Until the official results are published it is not possible to form a final opinion, but, approximately, for the cars finishing, the results by net time for the two days are as follows, the figures following the times which we give being the fuel and water consumption. The two Knox "Waterless" petrol vans appear to have accomplished their work exceptionally well, and we shall await the detailed figures with much interest.

Petrol Cars.

10-h.p. Knox van (No. 11), 7 hrs. 17 mins.; Fuel, 10¼ gals.
8-h.p. Knox van (No. 12), 9 hrs. 32 mins.; Fuel, 8¼ gals.

Steam Vehicles.

4½-h.p. Mobile van (No. 10), 10 hrs. 33 mins.; Fuel, 14¼ gals.; Water, 101½ gals.
15-h.p. Herschmann Exps. (No. 7), 11 hrs. 26 mins.; Fuel, 410 lbs. coal; Water, 332 gals.
30-h.p. Coulthard truck (No. 1), 17 hrs. 33 mins.; Fuel, 1,335 lbs. coke; Water, 869 gals.
20-h.p. Morgan truck (No. 9), 22 hrs. 13 mins.; Fuel, 900 lbs. coal; Water, 852 gals.

Electric Van.

6-h.p. Waverley (No. 5), 13 hrs. 23 mins.; Cost of current consumed, 2½ dollars.

In the case of the Coulthard vehicle, at a standpipe where it had to take in water, the ground had become so sodden that it sunk in some feet, and several hours were occupied in extricating it. The Judges rightly ruled that this time should not count against the vehicle, and therefore the time given above must not be taken as any guide in the results. The Coulthard entry was the object of much favourable comment throughout the entire trial. The only other mishap which this vehicle had was a break in the main steam pipe. We are pleased to learn that a gold medal has been awarded to this vehicle.

The Herschmann truck (No. 7) did well throughout, although several stops were made for adjustments, &c.

The Morgan truck (No. 9), was slow and had numerous breakages and was continually stopping—altogether a poor performance.

Belgium National Circuit.—The official results are now published in this event, particulars of which we gave in our issue of May 23rd. *Cars.*—1. De Crawhez (Panhard), 1,602 points; 2. Hombach (Vivinus), 1,585 points; 3. Criquelion (C.G.V.), 1,572½; 4. Van Langendonck (De Dion), 1,572; 5. Francotte (Malevez), 1,564; 6. Raczinski (De Dion), 1,557½; 7. Oppermann (Malevez), 1,556; 8. De Lunden (De Dion), 1,310½. *Motobicycles.*—1. Flamand, 596 points; 2. Elskamp, 590; 3. Preudhomme, 525; 4. Marnette, 518; 5. Heersbrandt, 360½.

THE competition of fuels for motors, organised by the A. C. de France, will commence on July 15th, and the cab and delivery van trials on October 5th.

THE Paris-Bordeaux casualties are responsible for the wholesale cancelling of speed events throughout France. Anticipating the action which the authorities subsequently took, the Rhone Automobile Club voluntarily abandoned their idea of having a road-race in connection with the Aix-les-Bains fêtes. In place of this speed race they are organising a three days' tourist event on June 24th, 25th, and 26th, over 800 kil., which is to be a trial of reliability and consumption. The classification will be by price. Otherwise the latest programme, as given for the Aix-les-Bains fêtes from June 22nd to 28th, will be adhered to.

The Glasgow to London Non-Stop Run will be repeated in 1904, again under the auspices of the Scottish Automobile Club.

A race from St. Petersburg to Moscow—430 miles—is announced to be under organisation to take place in August. There will be three categories. The entries total up to five large cars, ten light cars, and twelve motor bicycles. There will be six controls between the two points.

The Forezien Automobile Club have, in place of the speed trials which they announced last month, arranged a run and a hill climb for the 14th inst. to take place between St. Etienne and Bourg-Argental (46 kiloms.). This route will include two hills of 14 kiloms., with a 7 per cent. average gradient. Only four-seated tourist cars will be admitted.

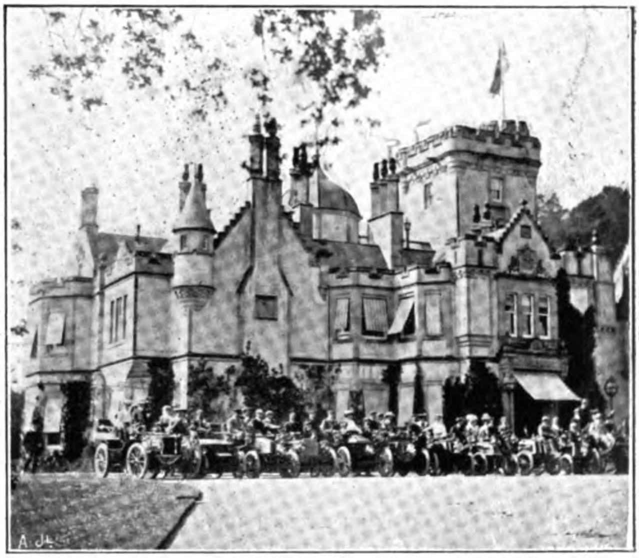
At Minneapolis (Minn., U.S.A.) the local club last month arranged a hill-climbing contest on Kenwood Hill. Classification was by price instead of weight. The meet brought together 25 petrol tourist cars, and the best times for the four classes over the hill of about half a mile were:—Cars up to £160, Rambler, 1 min. $55\frac{1}{5}$ secs.; up to £260, Knox, 1 min. 58 secs.; up to £350, Autocar, 2 min. 21 secs.; over £350, Toledo, 1 min. $15\frac{1}{5}$ secs. The cars had to run in ordinary tourist trim.

Although the Belgian Government have not notified the prohibition of the Circuit des Ardennes, last Saturday the Belgian Automobile Club, as we hinted in our last issue, decided to cancel this and all speed contests organised by the club, pending the remodelling of the conditions under which the races are to be run. On Tuesday, however, this was re-considered, and the Circuit will take place on June 22nd and 23rd. The Ostend Automobile Week also stands to commence on July 12th, a detailed programme of which we gave in our issue of May 23rd.

The occasion of the Fiesta de Los Angeles, Los Angelos, California, last month, was marked by an automobile floral parade and motor races on the Agricultural Track. A big gathering witnessed the various events, which included some hill-climbing feats on a 40 per cent. plank grade which had been erected. Considerable enthusiasm was displayed over the performances of the new White Steam touring cars, which were driven with consummate skill, in some cases by comparative novices. Track records were established for this class of vehicle by Frank Garbutt, who, on one of these cars, in a 5 mile open race, simply walked away from all competitors in the following times:—First mile, 1 min. $33\frac{3}{4}$ secs.; second mile, 1 min. $27\frac{1}{2}$ secs.; third, 1 min. $29\frac{1}{2}$ secs.; fourth, 1 min. $18\frac{4}{5}$ secs.; fifth, 1 min. 22 secs.

An electric motor car is being constructed for the International Sleeping Car Company, to be run on the Belgian State Railway between Brussels and Ostend. It is hoped to have this car running on the rails by August, and it is stated that the distance of about 125 kiloms. will be covered in less than an hour.

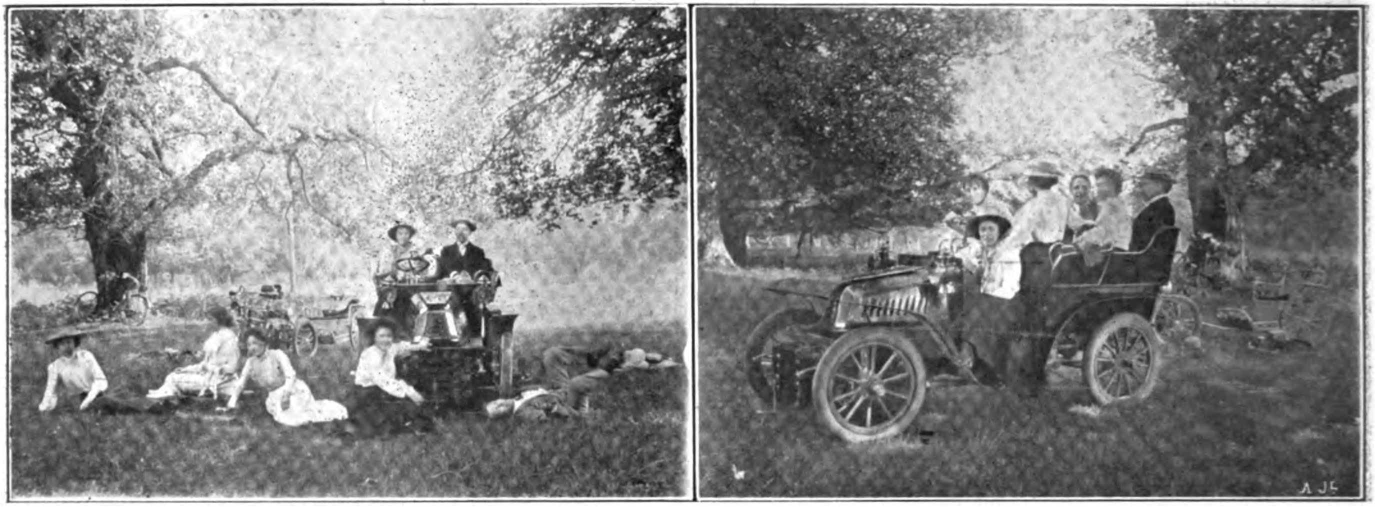
CLUB DOINGS.



The Scottish Club Run to the seat of Mr. W. S. Steel, of Philiphaugh.

Scottish Automobile Club's Club Run.—Philiphaugh, near Selkirk, where in 1645 the great Montrose was defeated by a force four times his strength under David Leslie, was the destination of the Scottish Club on Saturday last, the 6th inst. The day was gloriousle fine, and a large gathering in consequence collected to enjoy the hospitality of Mr. W. S. Steel, of Philiphaugh, at whose invitation the meeting took place. Cars arrived from all directions—Edinburgh, Glasgow, Stirling, Alloa, and other places being all represented—until over thirty cars, and guests in excess of a hundred, had congregated. Among the members present were Sir J. H. A. Macdonald, K.C.B., Mr. Norman D. Macdonald, Mr. John Macdonald, Dr. Dawson Turner, Mr. John Adam, Mr. R. J. Smith, C.A., Mr. George Macmillan, Mr. James Ballantine, Mr. W. E. Townsend, Mr. W. H. Steen, Mr. J. H. Steen, Mr. H. Prosser, Mr. Stevenson (Alloa), Mr. W. G. Allan, with whom were Messrs. Ross and McWhirter, Mr. Watt-Torrance, Mr. Seligmann, Mr. Blakeley, Professor Galt, Mr. John Wilson, Mr. R. Douglas Croall, Dr. Elder, Mr. W. C. Sleigh, Mr. James Rankin, and Mr. J. M. Inglis. Lunch was served partly in the dining hall and partly in a marquee, in which all the guests assembled at the conclusion of the repast. The usual toasts and vote of thanks to the host on the occasion were proposed and replied to briefly, a notable incident being the congratulations of the Club to the president on his appointment to the Honorary Colonelcy of the Motor Volunteer Corps. After some time spent in the inspection of the beautiful grounds, and a fine collection of Burmese curios, the parting began, and soon all were homeward bound. A contingent from the West country preferred to make a circular tour of the trip, and returned by Yarrow, St. Mary's Loch, and Moffat, a splendid outing being the result.

Manchester Automobile Club.—A visit was recently paid by the members of this Club to Astle Hall, Chelford, the residence of Colonel Dixon, J.P., Chairman of the Cheshire County Council. A splendid gathering of twenty cars, conveying about 70 members and friends, responded to the invitation. Col. Dixon's residence is a delightful old Cheshire mansion surrounded by spacious gardens and a lovely park, well wooded and containing a picturesque lake and stream, typical of Cheshire scenery. The time allotted for the inspection of the park and the exquisite gardens and conservatories was all too short when tea was announced as ready in the Hall. Ideal weather helped to make the excursion one of the happiest which the Club has so far had; and Col. Dixon's well-known enlightened and sympathetic attitude towards motorists in this county rendered the visit a memorable one for those fortunate enough to take part in it.



The Reading Automobile Club Run. Views in Savernake Forest during the rest for Luncheon.

Reading Automobile Club.—The third of a series of five monthly runs in connection with the challenge cup competition for reliability took place on Whit-Monday to Savernake Forest, Wilts, and back, *viâ* the main Bath road (64 miles). The weather and the road were perfect, and the run was keenly enjoyed by the participants. A picnic was arranged in connection with the run, and the members and their friends enjoyed luncheon beneath the shade of the stately oaks and beeches in the forest. The homeward journey was reserved for the cool of the evening. Amongst those taking part in the run were:—Mr. A. H. East (8-h.p. Corré) with the president, Dr. Walters, on board, Dr. Truman (9-h.p. Prunel), Mr. E. J. Wickens (20 h.p. Pipe), Mr. G. L. Brigham (Mabley), Dr. Major (Baby Renault), Mr. A. C. Brewerton (8-h.p. M.M.C.), Mr. Skurray (Accles-Turrell), Mr. C. H. Dodd (8-h.p. Renault), Mr. Arthur Phillips (Enfield Motor Cycle), and Mr. Albert E. Newton (De Dion tricycle and trailer). The two pictures which we reproduce are typical scenes in Savernake forest. These were taken by Mr. A. E. Newton, and convey an idea of the charm of a motoring picnic.

The Midland Automobile Club.—The President's Hill Climbing Handicap, which had been fixed to take place on the 20th instant, has now, owing to the absence of the President, been postponed until July 25th. Entries will close July 18th. Possibly it has been overlooked by the Club that this date is one of those selected for the Automobile meeting at Southport, with which it therefore unfortunately may clash. On June 20th the Club will have a run to Moor Court, Oakamoor, the residence of Mr. F. A. Bolton.

Norfolk Automobile Club.—Last week this Club held their second meeting at Sheringham under perfect weather conditions. In spite of the secrecy maintained by members of the Club as to the destination for the day, the County Police by some means had got wind of the route, with the result that traps were laid between Aylsham and Cromer. Fortunately the trick was discovered by the first car, the owner at once retracing his tracks and warning his fellow members, the rest of the automobilists, as they tore past the second ambush at at least five miles an hour, passing the time of day to the watching policemen. The Grand Hotel at Sheringham was selected for luncheon, where about sixty guests were provided for. Amongst those who joined in the run, some coming *viâ* Cromer and others by Holt, were Mr. G. M. Chamberlain, President of the Club, who presided at the mid-day meal, Baron and Baroness de Barretto, Mr. and Mrs. J. J. Dawson Paul, Mr. and Mrs. Arthur Wolton, Mr. and Mrs. H. L. Clark, Mr. and Mrs. Chamberlin (Yarmouth), Mr. J. Warnes Howlett (Secretary), and many other leading members. The only toast proposed, in a humorous speech by the Chairman, was "Success to the Norfolk Automobile Club." The outing was voted by one and all a delightful experience, and it needed no reminder from the Chairman that the next meet would be at Eaton Grove, the residence of Mr. J. J. Dawson Paul on the 23rd inst.

The Yorkshire Automobile Club.—Three miles beyond Harrogate, on the road to Ripon, lies the charming village of Ripley. This spot was selected last Saturday by the Yorkshire Automobile Club for the Saturday's run for their members, the meet for the different towns being at Poole Bridge at 3.45. The route taken was *viâ* Weton, Pannal, and Humphrey Bank. The Star Hotel was favoured by the members at Ripley, and a visit to the Castle grounds made a pleasant break in the journey. A picturesque spot at the village cross and stocks was selected for a photograph of the cars. Amongst those members who joined the meet were:—Mr. and Mrs. Faiers (24-h.p. Darracq), Mr., Mrs., and Miss Arnitage (11-h.p. Clement), Mr. and Mrs. Jessop (8-h.p. M.M.C.), Mr. and Mrs. Booth (6-h.p. De Dion), Mr. and Mrs. Whitworth (6-h.p. De Dion), Mr. and Mrs. Exley (6-h.p. Beaufort), Mr. and Mrs. Jones (Pieper), Mr. and Mrs. Firth (Quad), Mr. Steele (Benz), Mr. Parker (4½-h.p. bicycle), Mr. A. W. Dougill, hon. secretary (2-h.p. bicycle). By way of a change, on the homeward journey a horse-driven dog-cart was being consumed by fire, and it was difficult with passers-by to persuade them that it was not a motor car which was in trouble. Fortunately the police were conspicuous by their absence, and no unpleasantness with the custodians of the peace was encountered during the run.

Cheltenham and Gloucestershire Automobile Club.—At a meeting of this Club, held recently, Dr. H. P. Fernald, the President, in the chair, after full discussion of the Automobile Club Bill about to be introduced into Parliament, it was resolved that it was expedient that the present speed limit be removed, and means of identification enforced. Further that drivers should be held responsible as much as the owners, and that fines for excessive speed should be proportionate to the horse power of the motor vehicle. The present fine of £10, it was agreed, is excessive for persons of moderate means.

Kent Automobile Club.—The first run of this newly-formed but extremely vigorous young Club will take place on Saturday, the 20th instant. The members will meet at Charing, where tea has been arranged for 4 o'clock. The support being accorded to this Club throughout the county of Kent is remarkable, and already the membership approaches 100. The formation of the Club has brought to light quite a number of automobilists in the county who were only waiting an opportunity to join hands for mutual benefit and pleasure. The Committee is now engaged in selecting officers, and gentlemen wishing to join the Club should communicate with the Hon. Secretary, at the headquarters, Star Hotel, Maidstone.

Motor Volunteer Corps.—Last week Mr. E. H. Clift drove General Lord Grenfell, Commanding 4th Army Corps, and Brigadier-General Eyre Crabbe, Lord Grenfell's chief staff officer, to Tilbury, in connection with night operations on land and water. Further enrolment took place at headquarters on Friday, June 5th, and Tuesday, June 9th, for the London Command.

Liverpool has now acquired a motor fire engine for their fire brigade.

The French Aero Club are arranging balloon pursuit races by automobiles.

The Roadway Autocar Company are amongst the more recent subscribers to the Marcel Renault monument.

The Lincoln Motor Company have commenced operations at Saxilby for the erection of their new works.

The inordinate use of masks and goggles is one of those things which, though it does nobody any harm, causes for some incomprehensible reason quite as much irritation to non-motorists as any other idiosyncracy of car drivers, partly, perhaps, because they are ugly in themselves, and also, it may be, because they are a sort of declaration of intention to rush along at top speed at the first opportunity. Of course, in the open country on very dusty days these appliances are invaluable, but passing through towns, particularly through the Metropolis, where their use is hardly ever necessary, we think car drivers would be well advised to restrict their use as much as possible.

The following is the *Daily Telegraph* idea of a "motor car accident." Whilst following the butchers' walk to Brighton last Saturday, at one point near Earlswood the bicycles and cars of the officials were clustered so thickly, that the front wheel of a bicycle ridden by Mr. Parker touched the back wheel of the bicycle ridden by another official, Mr. Tibbetts. Mr. Parker fell off his machine in front of the car containing Mr. Val Hunter, the referee, Mr. P. L. Fisher, the judge, and the timekeepers. The front wheels of the motor passed over Mr. Parker's chest, and the chauffeur so quickly applied the brakes that he prevented the back wheels going over Mr. Parker, otherwise Mr. Parker, it is stated, would have been killed. As it was, he appears to have escaped without any serious injury. To call this a motor accident hardly needs comment. Possibly "Rusticus" may have been in the editorial office when this little bit of news was put under this heading.

FROM A MOTHER OF MANY "BILLS" (evidently gone astray).

The Hediter,

Sir,—Knowin as you represents the interests of the pore people against the aughtymoters as I hear they is called in London I should just like to tell you what *I* think. I live in a village in Surrey and am the mother of nine childern. Up to this year they have always playd in the road front of the house and the naybors used to say it were quite a pretty site. This spring Bill Jones' lurcher what does a bit of rabbiting now and agen was run over at the corner by one of these 'ere aughtymoters and 'is tale cut orf, so now I cant let the pore childern play in the road and they has to play in the gardin along er the washin. I arsks you is this rite? Then we used to tie our donkey acrost the road with a rope so as he could eat the grass both sides of the road and the edge. There wasn't nobody come along but the milkman, and he used to get down and undo the donkey and go on agen. Only last week a aughtymoter car come along and run over and broke the donkey's rope and scrazed some of 'is 'air orf, and he run orf for the day. Again I arsks is this rite! I don't get about much and I don't read the papers but they do say as ow things is much wuss on the big roads and that even when its rinening no one carnt see acrost em for the dust what the juggernorts as our pleeceman calls em raises, and near round London he tells me you carn't drive a cart without scrunchin the bones of the pore creetchers what these same aughtymoter juggernorts as nocked over and killed. Agen sir as the mother of nine childern (which I dont know what to do with in the gardin they is that noisy) I arsks *is* this rite?

Yors trooly

A Mother of 9.

The use of bath chairs should surely be regulated. Only last week we witnessed some exciting evolutions of a carriage horse meeting one of these dangerous vehicles. The bath chair had to be stopped and positively drawn aside before the docile quadruped would pass the spot.

The "Locomobile" Company of Great Britain, Limited, have now been appointed sole agents for the Oldsmobile car in Great Britain. They notify us that after this date no Oldsmobile will be shipped to England except to their Company. The price of the car, fitted with the new 1903 carburettor, will be £150 nett. Reliable agents, who are prepared to handle this car, are asked to apply to the Locomobile Company.

Rumours are rife in Glasgow to the effect that the Beardsmore firm, the famous armament makers and shipbuilders, have marked off 20 acres of ground at Cardonald, near Glasgow, for the erection of an automobile factory. Should the rumour prove correct it will be of considerable importance to the automobile industry, as this concern is assuredly one of the best managed companies in the United Kingdom, and is not likely to take any commercial matter up except in a perfectly systematic and energetic manner.

The Ranelagh Club Automobile Gymkana programme for to-day (Saturday), commencing at 3.30 p.m., will include (1) A bending race for motor carriages (handicap), in which the cars will pass in and out and between staves. (2) A coach-house handicap, to get a carriage out of the coach-house from an awkward position, and on return turn the carriage inside the coach-house. (3) Ladies' race in motor carriages (handicap). (4) General handicap for motor carriages. (5) Ladies' passenger race (handicap) for four seated cars only. (6) Starting and stopping handicap, starting from a line and racing over a straight course and terminating over a line but without touching a brick wall. The afternoon will conclude with a competition for appearance, the general get-up of car and occupants being taken into consideration. Tall hats, &c., are not essential for this competition.

An amalgamation has taken place between the Italian Automobile Club and the Lombardi Automobile Club, by which the friction hitherto existing between these two bodies will be removed. The title which the combined Clubs will adopt is Automobile Club Italiano di Milano. Chevalier Massoni has been elected President, the Marquis Camille di Soragna and Paul Meda, Vice-Presidents. Baron Albert Franchetti has been elected an honorary member and President of the Sporting Committee. Under the combined energies, the construction of a motodrome of 20 kilometres in length is being considered, the location of this being near Gallarate, about an hour from Milan by the electric railway.

Post-carts in South Africa are now being replaced in several districts by motor cars. The latest routes to be served by this means are between Potchefstroom and Mafeking, and between Krugersdorp, Rustenburg, and Zeerust. The inauguration of this service is being made the excuse to bring pressure to bear on the authorities to put the road in good order in several directions.

A receiver has been appointed to take charge of the assets of the American Motor Carriage Company, of Cleveland, U.S.A.

The Paris fêtes in honour of the Presidents and members of the foreign Automobile Clubs, announced for the 18th to the 20th inst., have been indefinitely postponed.

The Padua Race Meeting announced for June has also been postponed until September to enable the Italian builders to participate in the various foreign automobile fixtures. The 10 kilometres speed trial and the 300 kilometres road race will be included in the September meeting.

Only thirteen cars took part in the Long Island Automobile Club's floral parade, held at the end of last month, a show hardly worthy of so important a body. The pace of the procession was set by two policemen on bicycles, nominally at 8 miles per hour. There were plenty present who guessed the real speed to be nearly 18 miles.

By the new Bailey Act for regulating automobiles in New York State, 15 miles per hour is the limit of speed allowed in districts where the houses are not less than 100 feet apart. Under the New York municipal laws the top speed is 8 miles per hour. By reports to hand the municipal regulations will have to be brought into line with the Bailey Act, as serious trouble already looms large in the near future by the discrepancy between the two measures.

A Motor Lawn Mower made by the Coldwell Lawn Mower Company, of Newburgh, N.J., has been successfully put into work at Washington, U.S.A., where it is being employed in dealing with several hundred acres of lawn which has hitherto kept a large number of men continually busy from April to October. Steam is the motive power employed, the machine weighing 3,000 lbs. It has an 18-inch tubular boiler with a maximum pressure of 150 lbs. The fuel employed is petrol, and the drive is by a ¾-inch chain. Sixteen gallons of fuel suffice to drive the machine for its work of eight hours, several acres of lawn being mowed in this time. The path which the machine cuts is twice that of an ordinary large sized hand mower.

A good sporting course will be provided at Suresnes, within fifteen minutes of Paris, if the proposal to construct a motodrome, of about 10 kiloms. to the complete round, is proceeded with. M. Georges Prade writes very hopefully of it in *L'Auto,* and those who have discovered the spot point out the possibilities of constructing a course in the shape of an 8, which would give a good straight run on the flat, besides sharp inclines, and varying road conditions, sufficiently difficult to negotiate as to make a very good make-shift for tests in the event of road racing being permanently stopped by the French authorities. Within the circles of the figure 8 there will be ample room for cricket, football, polo, golf, &c.

New show rooms at 151–153, Wardour Street, Oxford Street, W., will be opened in about a fortnight's time by Messrs. Frank F. Wellington, Ltd., this firm's lease at 36, St. George's Square, having expired. At the new rooms Messrs. Wellington will hold a regular stock of Brooke cars, Panhards, Clements, and other leading makes.

Beware!!—Between the ninth and tenth miles from Leeds, on the Selby Road, there are two police traps of half mile and quarter mile each on a down grade, and to stop a car which does not intend pulling up there the police drive a horse and trap across the road. On the same road, between the tenth and eleventh miles, there is a measured quarter mile on the down hill past the Boot and Shoe public house. Nearer Leeds, and between the Gaping Goose Inn and Garforth Bridge, are two more measured distances. Also between Addingham and Bolton Abbey the whole of the distance is measured out, and the police work different sections. There is another measured distance from Settle, viz., from the lych gate of Settle Church and the River Bridge.

Both single and double-cylinder Regal cars and 4-cylinder "Chainless" cars, we are advised, can now be supplied by Mr. Oscar Selbach practically from stock.

The new season's showcards for Clipper Continental Motor Tyres have just been issued, and any members of the trade who require these can obtain them free on application to the offices of the Company at 64–65, Holborn Viaduct.

Garage accommodation for over 300 cars is available at the premises of the Motor Traction Company, Limited, 27, Walnut Tree Walk, Kennington Road. The garage is open night and day, and moderate charges rule. Repairs can be very rapidly effected on the premises, and the machinery which the Company have in place enables them to deal with any breakage, however serious.

The booklet issued by the Continental Caoutchouc and Gutta Percha Company, "Motor Tyres: How to Treat and Repair Them," is an admirably compiled little pamphlet enabling users of these tyres practically to laugh at any difficulties arising from tyre troubles on the road. The Company draw particular attention to the advisability of making use of a special waterproof canvas-covered bag which they have placed on the market with a capacity for holding two inner tubes. They recommend this accessory strongly, as spare tubes when placed in the tool box are liable to be very easily damaged by the shifting of the tools when the car is in motion. The price at which these bags are sold should remove any hesitation in any automobilist in securing a supply for their use.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories either as their principal or part of their objects.

Charles Jarrott and Letts (Limited).—Capital, £10,000 in £1 shares. Object, to carry on the business of dealers in motors, motor cars, &c. First directors, C. Jarrott (governing director), W. M. Letts, and E. R. Kennedy.

The Edinburgh Motor-Omnibus Syndicate (Limited), 63, Frederick Street, Edinburgh.—Capital, £3,000 in 3,000 shares of £1 each. (Scotch Company.)

Teale and Company (Limited).—Capital, £2,000 in £1 shares (500 preference). Object, to acquire the business of a manufacturer and factor of and dealer in cycles, cycle and motor accessories, &c., now carried on at 42, Summer Row, Birmingham, as Teale and Co. First directors, Mrs. M. Teale, J. Bayley, R. W. Teale, and H. E. Salmon (all permanent).

THE AUTOMOTOR JOURNAL

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Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 3 ...		Races and Gymkhana, Phœnix Park, and possibly Torchlight Procession at night.
July 4 ...		Speed Trials, Phœnix Park; Motor Cycle Time Trials; Viceregal Garden Party.
July 6 ..		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy; 4 Mile Motor Cycle Race (Newcastle, co. Down).
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork.
		Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
*July 24 ...	...	100 Miles Quarterly Trial.
July 24–25	...	Southport Speed Trials.
July 25 ...	...	Midland Auto Club Hill Climb.
*August 10-22	...	Tourist Motor Bicycle Reliability Trial.
*August 22	...	Annual Open Race for Motor Bicycles.
*September	...	The 1,000 Miles Trial.
September 12	...	Hill Climb (Midland Auto Club).
October 10	...	Hill Climb (Midland Auto Club).
*November	...	Side-Slip Trials.
1904.		
	...	*Light Van Trials.
*Feb. 12-24	...	2nd Annual Exhibition of the Society of Motor Manufacturers and Traders at the Crystal Palace.
May. ...	...	Electrical Vehicle Trials (6 days).

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.		
June 22–23	...	Circuit des Ardennes.
June 18–28	...	Aix-les-Bains Auto Meeting (Auto Club du Rhone).
June 28 ...	...	Laffrey Hill Climb.
July 5 ...	...	Race Neuchatel-Corcelles la Tourne (Swiss A. C.).
July 12-19	...	Ostende Automobile Week.
July 15 ...	...	Competition of Fuels for Motors (A.C. de France).
July 19 ...	...	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 16	...	Race Trelex-Saint-Cergves (Swiss A. C.).
August 30	...	Criterium du Quart de Litre (*L'Auto*) 100 kiloms. Parc des Princes.
Sep. 6–13	...	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September	...	Udine Exhibition (Italy).
Oct. 5. ...	...	Paris Cab and Delivery Van Trials (A.C. de France).
Oct. 15–21	...	Leipzig Exhibition.
Nov. 15 ...	...	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.
December	...	Paris Salon (A.C. de France).

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to THE EDITOR OF "THE AUTOMOTOR JOURNAL," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

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PASSING EVENTS.

BELOW THE BELT.

IT would be difficult to give adequate expression to the indignation which not only every automobilist, and we might add every Irishman, but also every fair-minded person will have experienced at the course which, *it is said*, the Treasury proposes to take—viz., to charge for supplying the large number of police that will be required to keep the course during the Gordon-Bennett Race. If true, it would appear as if this were a disingenuous, not to say underhand, attempt to prevent the race from taking place, as in this country it cannot be stopped by the mere ukase of a Minister. The attempt ought not, however, to have any chance of success. If, as the result of the Treasury's declaration, the Irish Executive should refuse to supply the police, they will, as in cases of popular disturbance, be responsible for anything which may occur owing to the absence of the guardians of the law. In any case, the worst that could happen is that the Auditor to the Treasury should insist on the expenditure being surcharged to the local County Councils, and we do not see that there is anything in the Act under which the race is being held that in such a case would compel the County Councils to pay. We should advise the County Councils to take no notice whatever of this unconstitutional attempt on behalf of the Treasury to defeat an Act of Parliament which has been duly passed by all the estates of the realm. If the County Councils are ultimately asked to pay, they will probably fight; and in doing so they will be right. In any case, we feel sure that the automobilists of the country generally will see them through. Finally, we do not believe that the presence of the police, though advisable, is by any means indispensable. There are already several thousand stewards engaged to keep the course. Their number could easily be increased before the race, and the services of the police altogether dispensed with. We trust, however, the solution to the question will be found in the Club Secretary's telegram that there is no hitch.

THE FRENCH GOVERNMENT AND AUTOMOBILE REGULATIONS.

The French Government is not going to be carried off its feet by the somewhat artificial cataract of indignation and hysterics, for the breaking forth of which in the press of most European countries, the unfortunate Paris-Madrid Race appears to have given the signal. It is appointing a Special Commission, which has now been authorised by President Loubet, to enquire into the whole question and report generally on the situation. Commissions are not in France a polite method of postponing the consideration of a question till the Greek Kalends, and there is reason to believe that government legislation will follow quickly the presentation of the Commission's report. The Commission is a singularly representative one. It includes senators, among whom is M. de Knyff, deputies, one state councillor, a number of motor car manufacturers, including such names as those of Serpollet, Renault, Krebs, Chenard, and Darracq, together with a professor of mechanics, M. Kugler, M. Hospitalier, Forestier, and several engineers and mechanicians. The Commission is to report on such questions as the proper methods of using high-powered vehicles, the organisation of tests advisable for developing the automobile industry as distinguished from mere trials of speed on the roads, and the suggestion of means for diminishing possible nuisances caused by smoke, steam, exhaust, and above all dust, and for reducing accidents on the road. In addition the Commission is to consider the questions of instituting examinations for drivers for the granting of certificates, and the provision of effective means of identifying offenders against the law. It will thus be seen from the terms of reference to the Commission that the French Government, while anxious to protect the interests of the general public, fully recognises the great and growing importance of the industry and the future which is before it. It would certainly seem that considering the present heated state of newspaper opinion in this country much might be said in favour of a similar course being adopted by our own Government, particularly if an assurance similar to that given by the French Government that the report of the Commission will be followed by prompt legislation, were forthcoming. Thorough enquiry before a Commission would be very valuable, and is almost a necessary preliminary to satisfactory legislation. Such enquiry, if it did nothing else, ought to have the effect of showing that a large proportion of the statistics compiled in regard to motor car accidents are misleading, and that a large number of misadventures are daily attributed to the new locomotion for which it is not in the slightest to blame. A full and considerate discussion of the subject, such as the operations of a Commission collecting statistics permits, forms an admirable cold douche for the hysteria of excited persons who are desirous of affecting issues by distorting facts.

THE AUTOMOBILE CLUB OF SPAIN.—A CANARD.

A fine and well-feathered specimen of the *canard* has been winging its way through the columns of some of our contemporaries. It was alleged that the Automobile Club of Spain, which had gone to very considerable expense in arranging receptions in connection with the abortive Paris-Madrid Race, has been practically soliciting outside pecuniary assistance to help itself out of the liabilities which it had in this manner hospitably incurred. There is absolutely no foundation for the statement. Baron de Zuylen de Nyevelt, President of the Automobile Club de France, writes to *L'Auto* categorically denying the whole rumour, and sarcastically pointing out that for defraying the comparatively small deficit incurred there has been no necessity either to appeal to the "grandees of Spain" or to any other generous donors. In making public this statement, Baron de Zuylen draws attention to the extreme delicacy and courtesy of the Automobile Club of Spain, and desires that the foolish rumour should be contradicted as widely as possible, as its promulgation is calculated to annoy the members of that club.

THE HOUSE OF COMMONS AND LEGISLATION.

In our last and previous issues we have said all that we intend to publish for the present on the Juggernaut correspondence, and unless some new phase should arise, such as the development of symptoms of hydrophobia on the part of some of the writers, or the necessity for others being forcibly confined in strait-waistcoats, we do not propose to deal with it further. The correspondence has done its work. Our daily contemporaries would have us believe that it is the spontaneous expression of popular indignation. On the contrary, we believe that both it, and the articles by which it has been accompanied, have skilfully and artfully utilised passing occurrences merely to fan the prejudice that already existed in certain quarters into flame, and to afford opportunity for its expression. But however this may be, it has had its effect upon the members in the House of Commons. To contrast the debate which took place on Mr. Wason's motion on Thursday of last week with the tone that prevailed when the Gordon-Bennett Bill was passed is a revelation in what can be effected by an unscrupulous campaign in the Press. There is no doubt whatever that had a Bill been brought before Parliament last week that the result would have been to confirm, or even further reduce, the present speed limit, and to impose the carrying of conspicuous numbers or other means of identification as well. The opponents of any relief being afforded to motorists were numerous, and even Mr. Chaplin has gone over to the enemy. Mr. Scott Montagu and the President of the Local Government Board were, apparently, the only speakers in favour of removing existing restrictions in any form. It would be impossible to accord too much praise to the tactful, well considered, temperate, and at the same time progressive, speech delivered by Mr. Long. It seemed to embody in a short space almost all the sensible things that have been said on the subject since it first became a matter of general public discussion. In spite of clamour, and in spite of opposition in the House, Mr. Long still takes the sensible view that twelve miles an hour on open roads where the surroundings can be plainly seen, such as on Salisbury Plain or the Bath Road, is ridiculous, and that, on the other hand, the only adequate method of protecting the public is to provide means of satisfactorily identifying motor vehicles. Mr. Long sees no prospect of introducing legislation at present, and in that we recognise friendliness to the industry and common-sense combined. To bring in a Bill in the present temper of the public and Members of Parliament, incited to frenzy by a virulent Press campaign, would be most ill-advised. Exaggeration, as we have often said, invariably produces reaction, and probably, when Mr. Long sees an opportunity of introducing his Bill, members will have come to view the situation in more correct perspective. The importance of the spokesman of the automobile interest taking up a conciliatory and reasonable attitude was well illustrated by Mr. Long's speech. His hands were palpably strengthened by the character of the proposals which Mr. Scott-Montagu, on behalf of the Club, was putting forward, as Mr. Long was able to point to him as an authority who not only represented the interests of motor car drivers but also those of the general public, in as much as he was willing to make the concession on the part of motorists which the authorities were most likely to require. It will be remembered that this point came up for discussion between Earl Russell and other members of the Legislative Committee, Earl Russell's view being that it was not wise, in the first instance, for automobilists to proclaim that they were willing to make concessions at all. We have always taken the opposite view, and we regard Mr. Long's remarks on the subject as fully justifying the position which we, and those who agree with us, have maintained.

The Press campaign against the development of automobiles is not restricted by any means to this country. Both the French and German Press have been carrying it on with equal acrimony and almost with a greater disregard for decency, as they have actually been manufacturing accidents with horribly harrowing and picturesque details to support their contentions. The daily Press in this country is, of course, much too honourable to resort to tactics of this kind. They merely describe as automobile accidents mishaps occasioned by horses if a motor car is within half a mile. There is something very singular in the unanimity and energy with which, as at a given signal, the anti-motor campaign was started contemporaneously in a number of different and generally opposing daily papers. It would almost seem as if the whole campaign were prearranged, and that the authors were merely waiting for a suitable opportunity, which unfortunately was furnished by the accidents in the Paris-Madrid race, to let loose a series of letters and articles which were already to a large extent composed. At any rate, there seems to be more behind the Press agitation than meets the eye. One thing at any rate we feel convinced it is not, and that is the expression of the opinion of the majority of the community.

Since the above was written the *Daily Telegraph* has announced the termination of the correspondence. Probably with the amount of prejudice that it has evoked, particularly among Members of Parliament, its object was regarded as accomplished. No doubt, also, the necessity of having all possible space available for the flood of general news, which is increasing as the season progresses, may have contributed to this highly-desirable consummation.

R.I.P.

On the 17th inst., passed quietly away in Fleet Street,

"The Social Juggernaut."

(by "Rusticus" out of D.T.)

The demise of this at one time promising
prodigy is believed to have been due
to the opening of Parliament, and
the imminence of a variety of
social functions, complicated by a
mysterious disorder thought to
have arisen from disappoint-
ment that the ill feeling its
career engendered in some
quarters failed to lead
to any actual cases
of attack, assault
or battery on
automobilists.

A NEW OILFIELD.

The present high price of petrol and the threatened imminence, if not of an actual petrol famine, at any rate of a considerable increase in its price, renders the question of the future world's supply of liquid fuel one of very special interest to the automobilist. The interest is increased when it is borne in mind that from the same source, that is to say the crude oil of the oilfields, are obtained the lubricating oils which are of practically as much importance in self-propelled locomotion as the lighter products which actually furnish the motive power. It is with considerable satisfaction, therefore, that we chronicle the discovery and approaching development of a highly important oilfield in the south of the Caucasus, situated at no very great distance from the celebrated Baku oilfields, and, in fact, lying about halfway between Baku and Batoum, and almost equally accessible. The output of the new oilfield, which has hitherto only been "scratched," promises to be very large, and the oil hitherto obtained contains both light fuel, suitable for motor car purposes, and a very large percentage of valuable lubricating oils. One of the most remarkable phenomena of recent years is the manner in which the oil supply of the globe actually seems to grow. As far as can be judged, in spite of the enormous increase in the demand, the increase in the supply is doing more than keeping pace with it. Hitherto the advantage to the consumer has been largely discounted by the powerful organisations which control the output. We understand, however, that the new Russian oilfield has passed into the control of an exclusively English company which will be independent of all other combinations. In that case we may expect that a more pronounced effect upon the industry will show itself as soon as the new oil gets fully on the market. We sincerely trust the new Russian oilfield will not prove another Texas.

AUTOMOBILES IN MONTENEGRO.

WE have dwelt repeatedly on the services which the new locomotion is calculated to render in countries which are destitute of railway systems, or in which such systems are inadequately developed. It is a very obvious text from which to preach, but, strangely enough, seems to be a subject which the countries most interested in are the last to recognise the importance of. Countries, curiously enough, also, which have hitherto been looked upon as far from progessive, have in many cases gone further in adopting and developing the new traffic to public needs than has been done in communities that are usually looked upon as more progressive and go-ahead. This is notably the case in some out of the way parts of Spain and mountainous districts in Italy, and now the little State of Montenegro, which is innocent of a single railway, has commenced the experiment of introducing the automobile as the cheapest method in that mountainous country of improving the public means of communication. Everybody who visits Montenegro has hitherto had to ascend from the port of Cattaro to the capital, Cettigne—a rise of upwards of 2,000 feet—by horse power, and at least five hours has been usually expended on the journey. The road itself is very finely engineered, and a motor omnibus, which has now been put on it, accomplishes the journey in two hours. We trust that this excellent proof of its adaptability to a mountainous country which the automobile has thus given will lead to its general introduction throughout the principality. We may feel sure that that singularly progressive and liberal-minded ruler, Prince Nikolas, will do all in his power to promote the development of his country in this respect.

COMPENSATION FOR OUTRAGE.

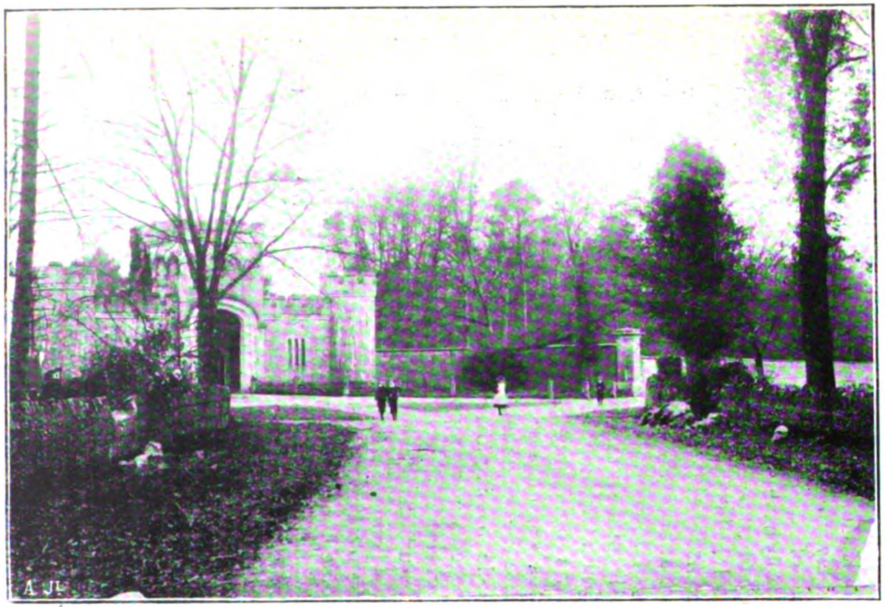
IRELAND presents many attractions to the automobile tourist. There is not only the beauty of the scenery over large areas of the island, and the amusing character of the population, but also the general sympathy with the new locomotion which has been developed among the inhabitants, and the easy and good-natured tolerance which the police extend to merely technical breaches of the law regulating speed. If Sir Ralph Payne Galwey's humanitarian proposal for shooting motorists with buckshot should be put into practice by some of the motorphobists—and there seem to be Members in the House of Commons by no means horrified at it—Ireland will be likely to be still more frequented by automobilists. If anybody is outraged in England he has no means of obtaining redress but to proceed personally against the offender. In Ireland, however, he can obtain compensation for outrages at the expense of the county in which they are committed. If motor shooting becomes at all general, therefore, we may expect a general exodus to the sister island, where, failing to catch their adversaries motorists will be able to obtain compensation for injury done to themselves or their vehicles from a public body which cannot hide or run away.

A NEW SOURCE OF RUBBER.

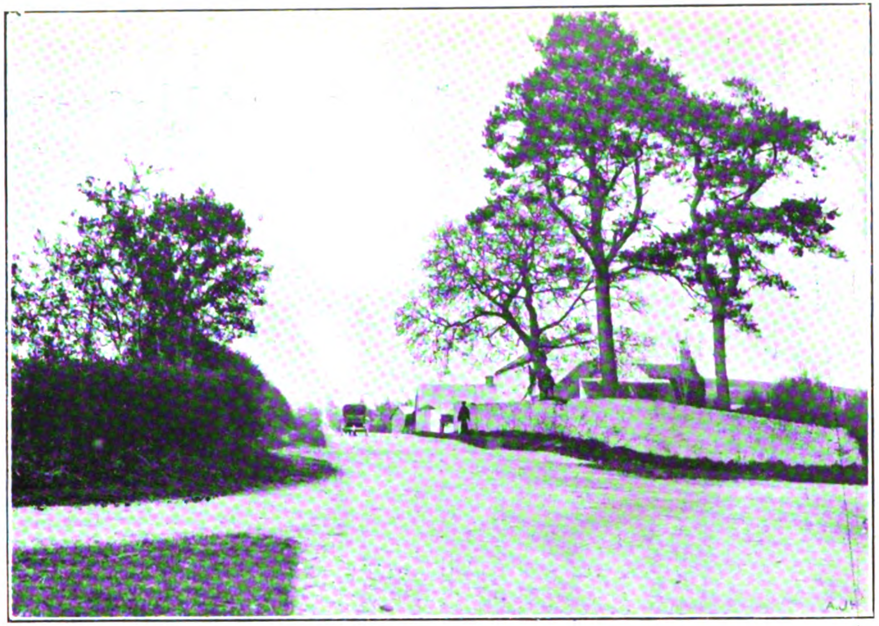
THERE is no substance of more importance in the automobile industry than the rubber of which the tyres of vehicles are constructed. In fact, it is the rubber tyre which has made the development of the modern motor vehicle a practical possibility. But for it everyone would probably still be contented with the existing legal limit of speed. It is good news, therefore, to learn that what appears to be high-class rubber has been discovered in the roots and stems of a plant rejoicing in the somewhat long-winded appellation of "landolphia thrallonii," which occurs in considerable quantity on the West Coast of Africa, the Lower Congo, and Northern Nigeria. The new rubber has been worked up and put on the market, it is said, at 3*s.* a pound, which is some 10½*d.* less than the best Para rubber. Of course, it is too early to say whether the new rubber is equal in quality to the Para material, but if it should prove to be so it will unquestionably have a very marked effect on the tyre industry, and in diminishing what constitutes one of the heaviest items in the upkeep of a touring car.

THE BAVARIAN PAVEMENT TAX.

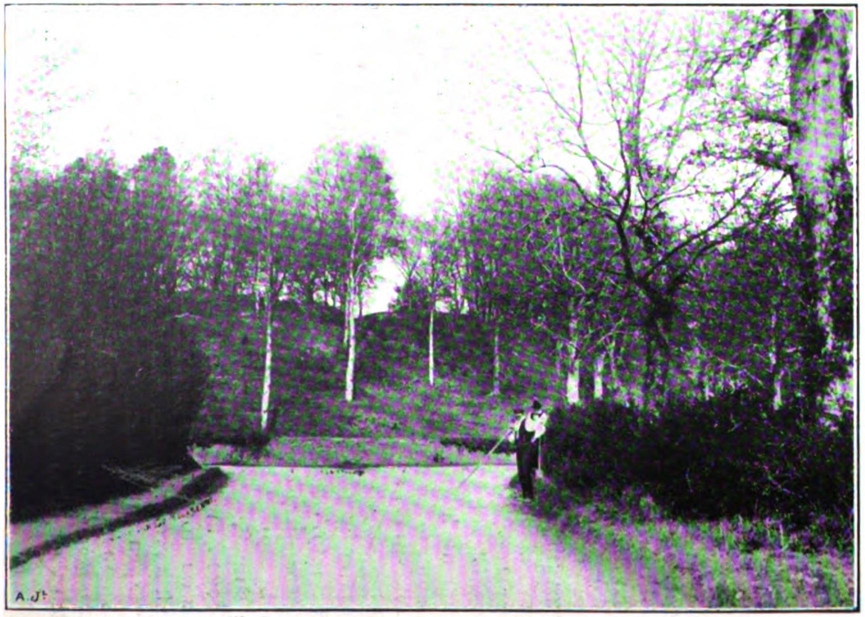
IT may possibly be some consolation to British automobilists for the ills which they are at times called upon to endure in this country, to know that there are parts of the world in which even worse sufferings are inflicted upon the votaries of the new form of locomotion. We have already had occasion to refer to the vexatious restrictions which have been introduced in Holland. In the United States many of the local State laws are more drastic and exasperating than even our good old statute of 1896 as administered by the authorities of Surrey and Huntingdon. In Germany, automobilists are generally treated with consideration owing very largely to the Government recognition of the importance of the industry, and the bearing it will unquestionably have on the future development of the country. All Germany, however, is not equally progressive. Bavaria particularly, though often picturesque is lethargic, and to a large extent behind the times. Many of the small Bavarian towns are at present endeavouring to make their antipathies a source of income. They have introduced what they are facetiously pleased to term a pavement tax for automobiles. Many South German towns and villages, like those in some parts of France, are paved with blocks of stone, or perhaps we should say boulders, which are so arranged as to cause the maximum of vibration and destruction to any vehicle passing over them. The tariff which these local wiseacres now propose levying on motor cars is to be exacted whenever they venture upon the boulder drift with which the surfaces of their streets are frequently embellished. There is a vein of sardonic humour about the proposed tax. The pavements of these South German towns have been avoided for many years both by automobilists and cyclists with the greatest possible care. We don't think the pavement tax will contribute very largely to the finances of the towns levying it, but it is well that English automobilists who intend travelling on the Continent should be acquainted with this up-to-date departure. Some drivers have had quite serious experiences with the tolls, for the offices where the toll is levied are sometimes exceedingly difficult to distinguish, and are readily passed by, whereupon the guardians of the law start in pursuit, and legal complications ensue.



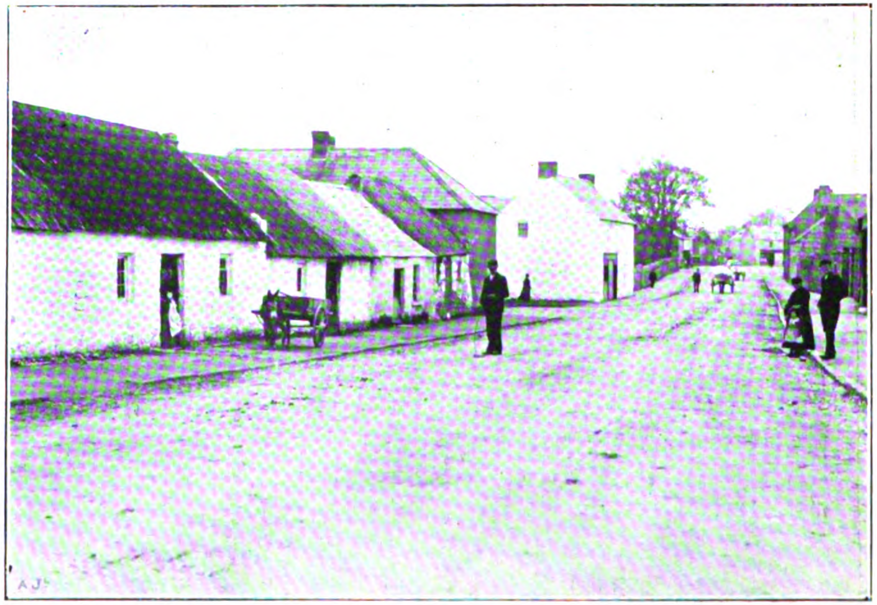
Lord Drogheda's Gate at Monasterevin.—The cars travel round the sharp bend in the road to the right.



Ballyshannon Cross Roads.—Near the Start.

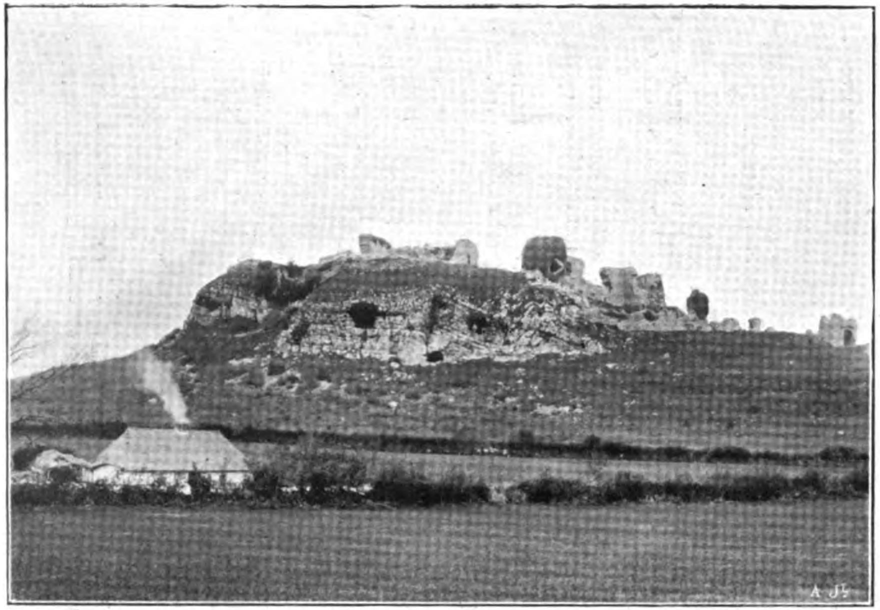


The Moat of Ardscull, from the Athy side.—A large stand will be erected here, giving a view for about three miles.

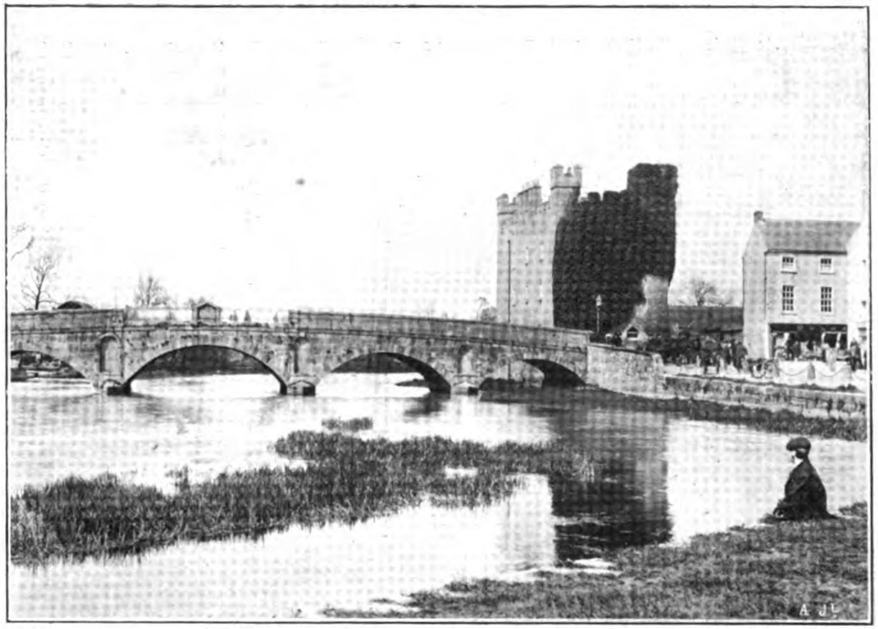


Castledermot.—A Typical Irish Village.

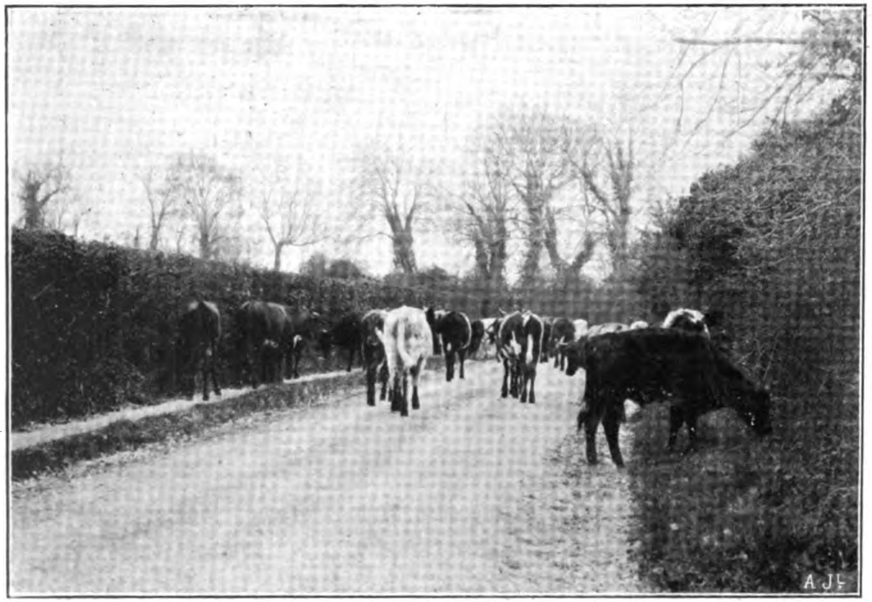
THE GORDON-BENNETT RACE.—SOME SCENES ON THE COURSE.



The Rock of Dunamase, from which one of the best views of the Course can be obtained.



Athy Bridge and Castle.



Beyond Carlow.—The free-grazing trouble. Without precautions this depicts what might be encountered round one of the corners.

An Irish "Onomobile.

THE GORDON-BENNETT RACE.—SOME SCENES ON THE COURSE.

THE GORDON-BENNETT RACE AND IRISH FORTNIGHT.

ORIGINALLY a pilot car driven by Mr. Mark Mayhew was to precede the racing cars round the course half an hour prior to the start of the racing cars. It is now arranged that two pilot cars will start at 6.30 a.m., one going east and the other west, thus warning the public along the entire course that the race has begun.

A CAR bearing the word "Finished" will immediately follow the last car round the course.

FROM the latest information to hand it is by no means certain what ultimate effect the burning of the Mercedes-Daimler racing cars will have upon the selection of the representatives of the German Club in the race. The most sportsmanlike disposition has been shown on all sides to come forward and help the Cannstatt Daimler Company out of their difficulty by the offer of the best available cars for taking part on behalf of the German Club in the contest. Official notification has been given that Germany intends to be represented and will make as good a fight as possible under the disastrous circumstances, and we doubt not in the result a good showing will be made by the scratch cars which will necessarily have to be put forward in their interests.

LAST Saturday M. Fernand Gabriel, the winner of the Paris-Bordeaux section of the Paris-Madrid Race, was elected a member of the A.C. de France. M. Gabriel will be one of the representatives of France for the race, in place of M. Fournier, and will drive the Mors car. Salleron will be the Mors reserve driver. Fournier joins the Hotchkiss Company.

ALEXANDER WINTON and Percy Owen are staying at the Rectory, Timolin.

TWO additional controls have been added, one at Monasterevin and one at Stradbally, making seven stops in all which will have to be made on each round. Carefully prepared maps in English, French, and German will be supplied to each of the drivers. These maps will show the road in sections, indicating the various flags along the route and giving their meaning, so that the minds of the drivers may be assured as to the meaning of any particular sign. The signs themselves will be of such a nature for indicating bad corners or dead stops, etc., that it will be impossible for them to be missed at whatever speed the cars may be travelling.

THE elaborate scheme, originated by Mr. Robert E. Phillips, to ensure accuracy in timing the Gordon-Bennett cars should prevent the smallest question arising hereafter in regard to any competitor being debited with more control time than that to which he is entitled. No fewer than 84 watches will be employed, viz., 12 at each control, each car having allotted to it a special chronograph. By this means all question must be eliminated as to the correctness of the time. In international contests it is of paramount importance that no possibility of a query should arise, and the methods adopted by the Automobile Club, at the suggestion of Mr. Phillips, will unquestionably do away with all chance of a dispute.

A VERY onerous duty has been undertaken by the Motor Cycle Union of Ireland, who, upon the invitation of the Automobile Club, are organising the large body of motor cyclists required to act as dispatch-riding stewards on the day of the race. They will be employed in keeping up communications between the controls and the headquarters at Ballyshannon House. As a very large number of cyclists will be necessary, riders who are willing to act on the day, whether members of the Union or not, and whether resident in England, Ireland, or Scotland, are cordially invited to send their names and addresses to the Secretaries of the Union, 11, Lower Sackville Street, Dublin.

IF all accounts be true the crush to get across to Ireland for the Race is likely to be appreciable. Mr. Holbein, who, by reports, is desirous of witnessing the Irish motor race, is evidently going to take no chances of being crowded off the steam packets, as he intends to swim the Irish Channel on the occasion.

THE Duke of Manchester has offered his castles of Tanderagee and Kylemore to the A.C. de France for the use of their members, so that they may have facilities for repairs in the Duke's workshops and have full use of the power station for charging their accumulators.

THE rules governing the Gordon-Bennett Race, and also the general racing rules recognised by the Automobile Club of France, have been reprinted by the Automobile Club and issued in booklet form. Coming as this does at the moment when the whole of the automobile world is vastly concerned with the great international race, it should prove of use to those more directly interested in the event.

THE Vacuum Oil Company will have special depôts for the supply of lubricants at the following points:—Ballyshannon Cross Roads, Carlow, Athy, and Kildare.

THAT there will be an adequate supply of motor spirit during the month of July in Ireland is now assured, as, thanks to the energy and system of the Anglo-American Oi Company, depôts have been established at all the chief points which will be visited, where automobilists can be sure of obtaining whatever quantity of motor spirit they may require.

Considering the conditions which have hitherto prevailed in the Emerald Isle for the supply of motor spirit, the thanks of automobilists are due to the Anglo-American Company for their foresight in this matter. In addition, they are making special arrangements, at such places as Holyhead, Fleetwood, Liverpool, and Stranraer, for the convenience of motor car owners on their return from Ireland, to ensure there being no shortage of fuel. Writing to us upon this vital subject, the Company say:—

> It has been exceedingly difficult to accomplish what we felt to be necessary to ensure there being agents for Pratt's Motor Spirit in all parts, especially the more remote districts of Ireland. The Company's Irish branch has given continuous attention to the question, and we are now able to furnish you with the lists of the Anglo-American Oil Company's retail agents for the month of July. During this short period our Company has taken the full risk of sending their motor spirit to all the agents named, with the understanding that if not sold it could be returned without expense to the retail agent.
>
> List No. 1 contains the towns and names of the retail agents therein, especially selected as those to whom motorists might write and pay in

advance to ensure procuring a supply of motor spirit being held for them during July, with the understanding that if not taken during the month of July it becomes the property of the sellers.

List No. 2 is likewise agents appointed for the month of July, but with no special arrangement as in the first list. Each of the retail agents will commence the 1st July with a supply of Pratt's Motor Spirit, that will be supplemented day by day as sold.

Kindly remember that all names on each list are retail agents, but that in connection with list No. 1 special arrangements exist as to writing in advance *re* supplies.

A uniform retail price has been arranged of 1*s.* 8*d.* per gallon, and the usual 2*s.* for cans.

List No. 1.

Retail Agents to whom Motorists may write in advance for a supply of Pratt's Motor Spirit.

Belfast.—Ferguson and Macrae, 46, Victoria Street; J. and J. Haslett, 18 and 20, North Street; Thomas Mallon, 83 and 85, Ann Street; Northern Motor Company, 5, Montgomery Street.

Cork.—Dobbin, Ogilvie, and Co., Limited, King Street; Cork Chemical and Drug Company, 80 and 81, Patrick Street; Harris and Beale, 56, Grand Parade; Fair and Ridge, 112, Patrick Street; Baker and Wright, 48, Patrick Street.

Dublin.—Isaac Beckett and Sons, Fleet Street; Boileau and Boyd, Limited, Mary Street; Dolan and Sons, Bolton Street; H. Moore and Alexanders, Limited, The Linen Hall; John Clarke, Dundrum, nr. Dublin.

Killarney.—R. Hillard, New Street; C. Meagher and Son, Main Street.

Waterford.—G. White and Sons, King Street; Henry Bell, The Quay.

List No. 2.

Special Retail Agents during the Fortnight.

Athy.—Duthie, Large, and Co.

Ballina.—Adamson and Co., Knox's Street.

Ballymena.—J. McNiece, Mill Street.

Carlow.—The Motor Repairing Company, 19, Dublin Street.

Castlewellan.—J. McCartan.

Clones.—B. Hall and Sons; N. Ferguson and Sons.

Club Enclosure (Ballyshannon).—Anglo-American Oil Company, Limited.

Coleraine.—W. J. Baxter, 25, Church Street.

Drogheda.—John Collins, Shop Street.

Dundalk.—T. Williamson, Ironmonger, &c., Quay.

Enniskillen.—J. Lemon and Sons.

Galway.—Hill and Co., Cycle Agents.

Kilkenny.—Power and Son, High Street.

Killorglin.—T. and R. Stephens.

Kenmare.—D. O'Brien, Corkery, and Co.

Larne.—J. R. Canning.

Limerick.—J. and G. Boyd, Limited, William Street.

Londonderry.—Alexander Cycle Company, Limited, John Street; J. and R. Watson, 22, Foyle Street.

Naas.—Denis Donohoe.

Newcastle.—Donard Buildings, Limited.

Newry.—S. Connor and Sons.

Portrush.—A. C. Scott, Chemist, Main Street.

Portadown.—Hegan and Co., Cycle Agents, &c.

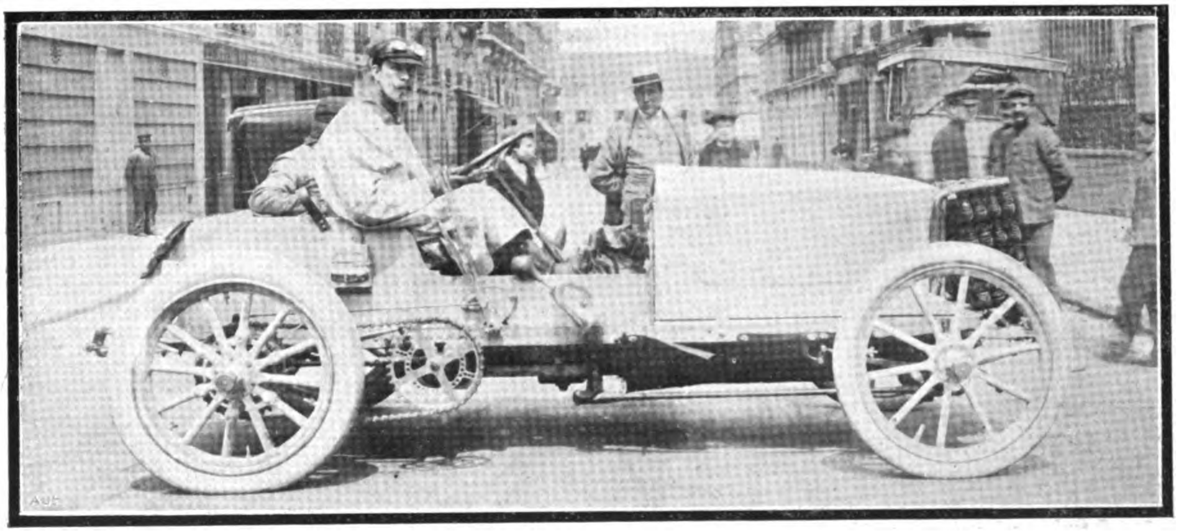
Queenstown.—Jas. Madigan, King Street.

Sligo.—J. and J. Graham, 9, Castle Street; J. and E. J. Tighe.

Tralee.—Thos. Galvin and Sons.

THE building of the road, under the direction of Capt. Carton, which was commenced some time ago in the Congo Free State, and is intended for automobile traffic, is said to be progressing favourably. The total length of the road will be 500 kiloms., but it is hardly as wide as might be desirable, the maximum width being only 8 metres on the plains and 6 metres on the hills.

THE large Swiss canton, Graubunden, has prohibited automobilism throughout its territory, so popular outcry, or perhaps we should say press outcry, can produce really dangerous results. It is not surprising to find that all the innkeepers of the district are petitioning the authorities to except at least the main roads of the canton from the restriction. We would commend the occurrence to the attention of licensed victuallers and innkeepers in this country.



It is with the greatest regret that we have to announce the death, after lingering about three weeks, of Mr. Loraine Barrow last Saturday afternoon at Libourne. Mr. Barrow, who was an enthusiastic automobilist, owes his death entirely to a stray dog which crossed his path during the Paris-Madrid Race and became jammed in the steering gear, thereby causing the lamentable accident which has brought about not only Mr. Barrow's death but that of his mechanician. Mr. Barrow was one of the best known figures at Continental automobile events, and not only took part in the recent contests at Nice but was one of the drivers both in the Paris-Berlin and the Paris-Vienna Races. We are able to reproduce above a photograph of Mr. Barrow on the De Dietrich Car on which he started fifth in the race. For some years Mr. Barrow had settled at Biarritz, where his interment took place on Wednesday in the same grave with Pierre Rozez, his mechanician, whose body was disinterred for this purpose.

THE 16-H.P. "KRUPKAR" PETROL VEHICLE.

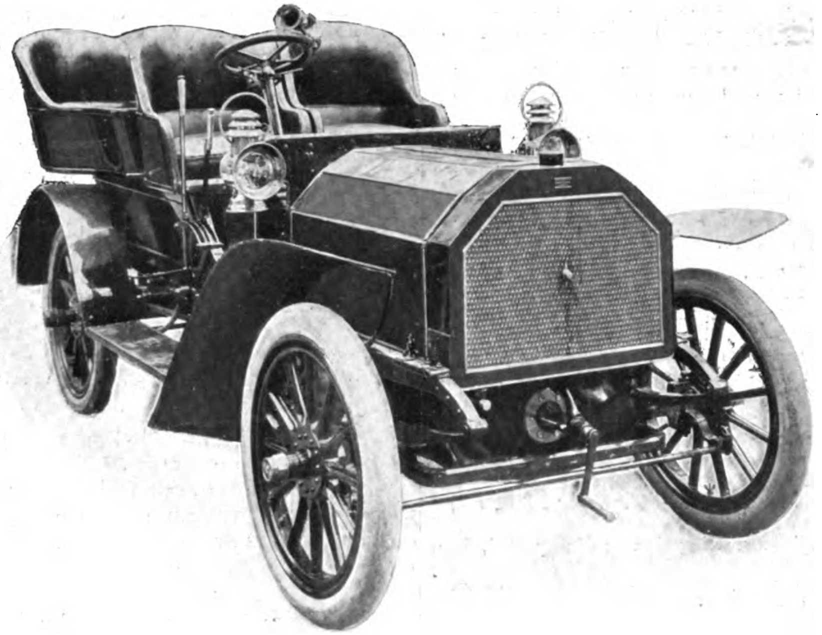


Fig. 1.—The 16-h.p. "Krupkar."

Reference has already been made to the new vehicles which have been put on the market in this country by Krupkar, Limited, of Trevor Square, Brompton Road, and we recently gave an illustration of the 10-h.p. model, together with a few brief notes concerning it. The name "Krupkar" has been taken in consequence of the fact that the metal used in the construction of these vehicles is obtained from the celebrated firm of Krupp and Co., of

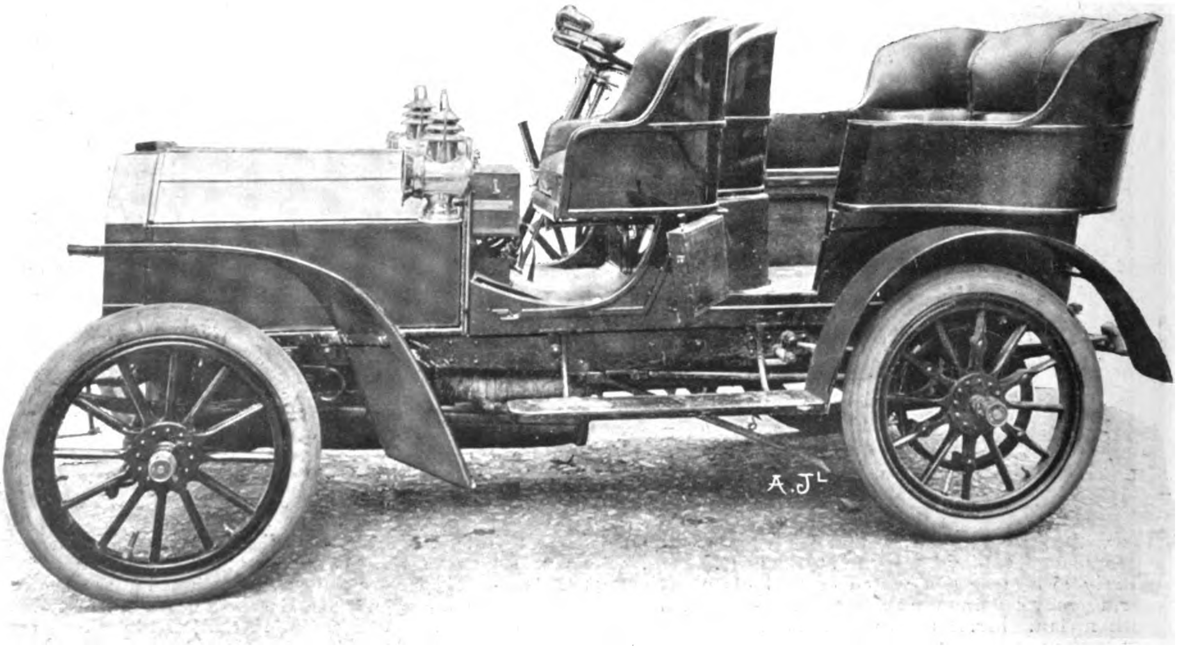


Fig. 2.—The 16-h.p. Car, showing Front Seat slid forward to give access to Tonneau.

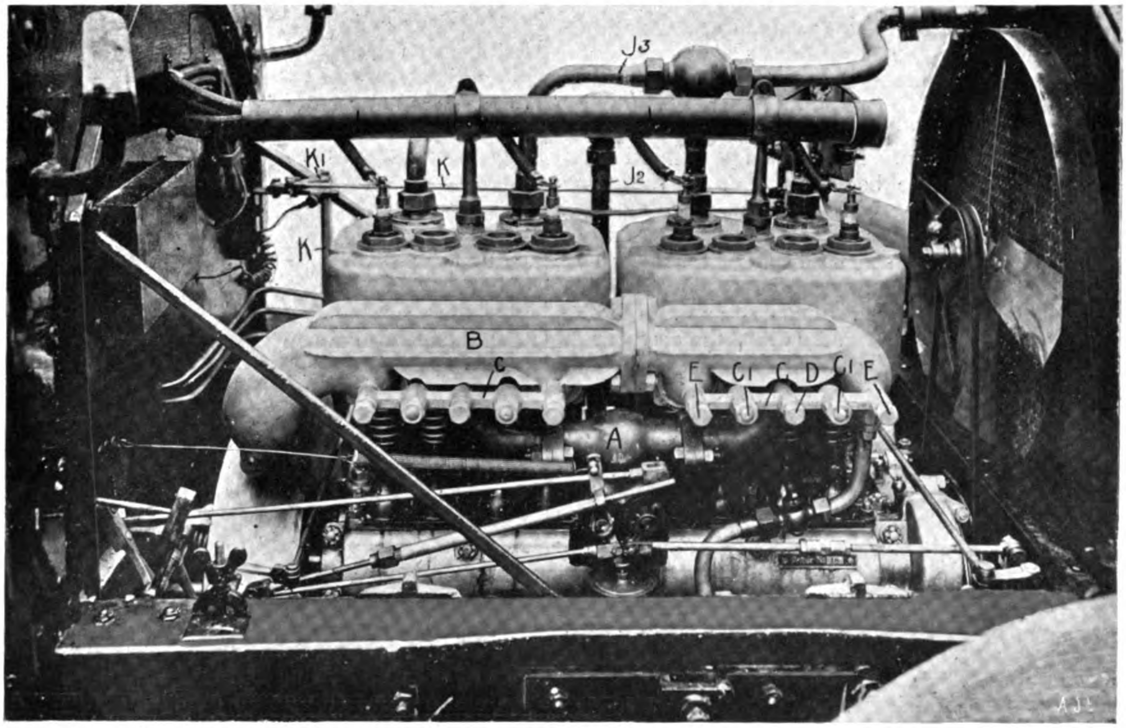


FIG. 3.—The Engine in place (right side).

Essen; they are built on the Horch system. They are extremely well made throughout, and certainly rank amongst the best petrol cars which are now on the market, for which reason, coupled with the fact that the price asked for them is decidedly moderate, they are likely to become very popular in this country, and deserve the attention of those requiring a strong and serviceable vehicle.

In general design they resemble other cars in which a

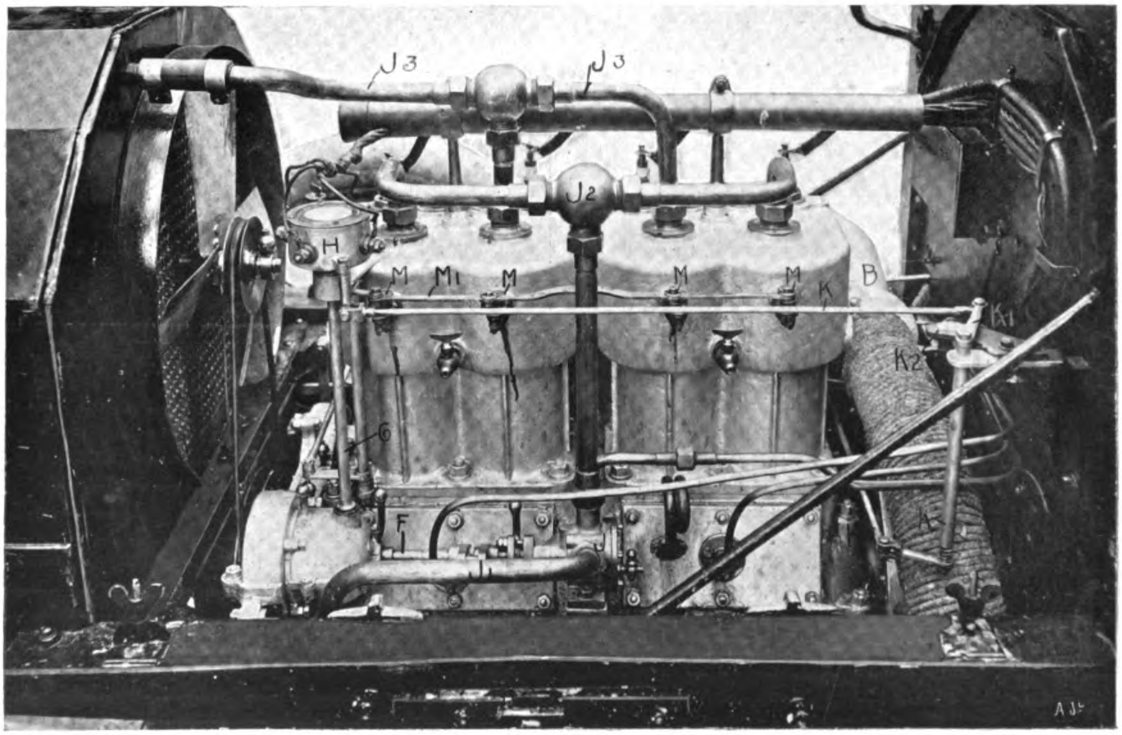


FIG. 4.—The Engine in place (left side).

live axle is employed, in preference to side chains, for transmitting the power from the gear-box to the rear wheels, but, unlike many other vehicles, ball bearings are employed to a considerable extent. The main frames are constructed of armoured wood, and the engines and the gear-boxes are both fixed directly to them. Mechanically-operated inlet valves are employed, these being arranged in the same valve-chamber as the exhaust valves, so that a single cam-shaft serves for all the valves. A high-tension system of ignition is adopted, and a special form of throttle valve control is used. The circulating water is cooled by a radiator of the honeycomb type, which, as usual, forms the front of the bonnet; a belt-driven fan draws the air through it. The change-speed gear gives a direct-through-drive on the top speed, and the lay shaft carrying the lower speed gear wheels continues to revolve whether the power is being transmitted through it or direct. A single side lever, working in a plain quadrant, introduces all the various speeds, and a very neat safety device is fitted to it for preventing the reverse from being brought into play unintentionally.

The cars have a long wheel-base, and are supported on semi-elliptic side-springs front and rear. The rear springs have shackles at both ends, and there are radius rods connecting the back axle with each side of the main frame. All four wheels, which are, of course, of the artillery type, are the same size.

The leading features which we have just enumerated are common to all Krupkars, whether they have four or a less number of cylinders. Other interesting details of the 16-h.p. model will be dealt with in turn in the following description of this 4-cylinder car—a description which we are able to give after having made a careful inspection of it and having given it a practical trial.

The 16-h.p. vehicle is shown in Figs. 1 and 2. It is fitted with a neatly designed and well finished body, the tonneau of which accommodates three passengers comfortably. The front seats are of the "bucket" type, and that on the near side is arranged in such a manner as to give access to the tonneau from the side of the car instead of from the back. In Fig. 2 it is shown with the seat drawn forward, and the small door, which normally lies beneath it, opened. The seat is fixed to a steel rod passing beneath it, and this rod slides in a guide which is rigid with the main portion of the carriage; small rollers are also arranged beneath the seat. After removing a safety bolt, the seat can be pushed forward with ease, and the small door beneath it being then opened, a convenient and wide entrance to the tonneau is obtained. The long wheel-base, coupled with the excellent springs, with the well-governed engine, with the armoured wood frame, and with the large pneumatic tyres, render the car one of the most comfortable and easy riding petrol vehicles which we have tried; the tyres are 810 mm. in diameter by 90 mm. wide.

The engine, fixed in place in the car, is seen from either side in Figs. 3 and 4. It is extremely accessible, because the bonnet can be quickly removed, and is more particularly so, because the front mudguards are fixed in such a way that they can be taken off after loosening a single bolt. The bonnet itself is held down by two fly nuts on either side, the fly nuts only needing to be slackened to allow small yoke pieces beneath them to be moved round so as to free a flange projecting outward along the sides and at the bottom of the bonnet. The bonnet itself is very flexible, being hinged in the direction of its length, at each of the corners.

The four cylinders are cast in pairs, and the valves are arranged on the right hand side of them. Inspection plugs are fitted above each valve, and those which lie above the inlet valves receive the vertically-placed ignition-plugs. The pipe-fittings, A and B, which lead the explosive mixture to the cylinders, and the exhaust gases from them, respectively, are held in place by yoke pieces, C, which are secured to each cylinder casting by two studs, C¹. The set screws, D, which pass through the centre of the yoke pieces, secure the induction pipe, and the set screws, E, at each end hold the exhaust pipe. The carburettor is of the float-feed spray type, and is fitted with a special form of throttle valve one member of the throttle valve is connected to the governor, and another member to the accelerator lever in front of the driver, near the dash; the relative positions of these two members determines the size of the passage through the valve. A second throttle valve, which is of more ordinary construction and is arranged between the governor-controlled valve and the cylinders, is connected with the main clutch in such a manner that the engine is automatically slowed down when the clutch is withdrawn. The exhaust pipe, B, passes across above the fly-wheel to the other side of the car, and leads to an exhaust box beneath.

The cam-shaft together with the cams are enclosed in a part of the crank-chamber, and the gear-wheels which drive it are also provided with an oil-tight casing. A centrifugal governor is fitted on the crank-shaft, and is also enclosed in a casing. Another shaft, F, on the opposite side of the engine to the cam-shaft, is driven by enclosed gearing from the crank-shaft. It carries a bevel wheel which meshes with a corresponding wheel on the lower end of a vertical shaft, G, which carries the commutator, H, at its upper end. The circulating pump, J, of the eccentric type, is coupled to the shaft, F, also, drawing the water through the pipe, J¹, from the radiator, and forcing it through, J², into the top of the cylinder jackets. The water from the jackets is also led back to the radiator by pipes, J³, which lead out at the top.

The time of ignition is varied from a small lever on the steering pillar, the connection between it and the commutator being through the rods, K. This system of rods is so arranged that a small lever, K¹, forms a part of it, and it also constitutes the main switch for establishing the electrical circuit between the battery and the coils. When the time of ignition is retarded to the full extent of its useful range, the lever, K¹, which until then had been in contact with an insulating contact, K², then leaves it, breaking the circuit. The result of this arrangement is that the car can be stopped at any time by moving the timing lever to the full extent of its range in the one direction, and that, when it is desired to restart the engine, it is only necessary to move it in the other direction for ignition to occur in one cylinder, if a sufficient charge remains there; in the majority of cases the engine restarts, in this way, automatically without having to use the starting handle. The high-tension wires leading to the ignition plugs are carried in a fibre tube, which is placed across above the cylinders. Half-compression cocks, M, are fitted to all four cylinders, and are connected together by means of a bearing, M¹. These cocks are operated from a small handle which projects forward, just beneath the cooler in front, so that when starting the engine with the handle the compression can be conveniently relieved.

On the two-cylinder 10-h.p. car, half-compression for starting is provided for in a different manner, the cams being arranged to slide on the cam-shaft, and being so shaped that they hold the valves open during the first part of the compression-stroke. The commutator on the smaller engine is fitted direct on the front end of the cam-shaft, instead of being driven through bevel gearing; the circulating pump, however, is mounted in a similar manner.

The main clutch, which is of the cone type, is fitted into the flywheel, but differs from ordinary practice in having two springs to hold it in engagement instead of one concentrically-arranged spring. The female member is carried by two arms, the helical tension springs being fixed at their one ends to them, and being connected at their other ends to the boss of the male member. The engine and the clutch are closed in from beneath by a light casing, through the front end of which the crank-shaft projects to carry the starting-handle.

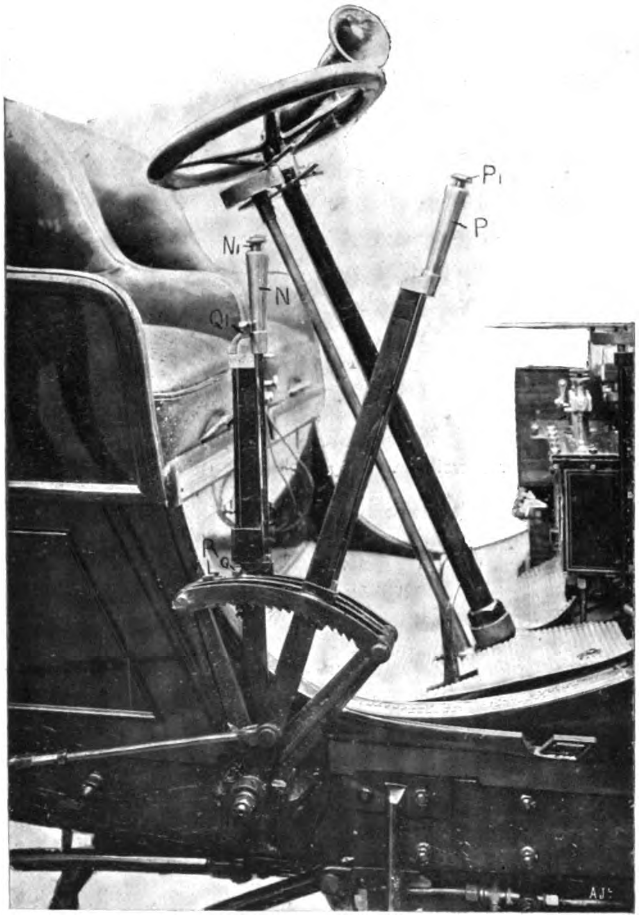


Fig. 5.—View of Regulating Levers and Pedals, showing "Reverse" Safety Catch.

The change-speed gear provides four forward speeds and a "reverse." It is of that type in which a direct-through drive is obtained on the top speed, the lower speeds being secured by means of a lay-shaft and sliding spur-wheels. The lay-shaft at all times revolves. Both it and the direct-through shaft are mounted in ball bearings. The gear-box is fixed to the main-frame itself, and a universally-jointed shaft transmits the power from it to an enclosed live-rear-axle of substantial construction.

The change-speed lever, N, as also the other regulating levers and pedals, are seen in Fig. 5. The lever, N, and the emergency-brake lever, P, are fitted with quadrants lying side-by-side with one another in the usual way, and there are spring push-rods, N^1 and P^1, arranged in the upper ends of the levers respectively, which control the catches engaging with notches in the quadrants. The lever, N, is also fitted with a small spring catch, Q, which can be lifted upwards against a spring by means of a small projecting handle, Q^1. The catch-piece, Q, would normally come into contact with small projections, R, on the quadrant, and so long as it could do so it would be impossible to move the gear lever, N, to the reverse position. It is therefore necessary, in order to introduce the "reverse," that the handle, Q^1, should be first raised. This neatly-arranged safety device prevents an accident occurring through introducing the "reverse" gear when still travelling forward, an occurrence which might happen under certain circumstances, and might lead to serious consequences.

The live axle has five ball bearings supporting it, and the short shaft carrying the smaller bevel wheel which drives it, is provided with two ball bearings. The hub of the rear wheels carry large brake drums, which are acted upon by brake-bands connecting to the hand lever, P, beside the driver's seat. The front axle, carrying the steering heads, is bent so as to bow forwards between them in order to clear the engine; it is strongly made, and being shaped in the manner just described, gives greater clearance space beneath the car, without in any way restricting the free play of the springs. The front wheels run upon double ball bearings on their stub-axles. The car is provided with two sprags, which are fitted beneath the side members of the frame; they are fulcrumed to it nearly centrally, and are unusually long. The sprags are connected by cords, which pass up through the centre of the floor in front of the driver's seat.

The engine is lubricated from the dashboard under pressure, the pressure being maintained by the circulating water in the manner with which our readers are already familiar.

* * *

A public-spirited motor bicyclist, Mr. K. Hitchcock, has paid the penalty of his anxiety to save others from a police trap in the neighbourhood of York. Mr. Hitchcock had a number of bills bearing the superscription "police trap" printed, and pasted them on telegraph poles some distance in advance of a police ambush, so the police proceeded against him for riding his motor bicycle in excess of the legal speed, and for posting the bills on the telegraph posts. He was fined 50*s.* for exceeding the speed limit, and 10*s.* for posting the bills. Of course, it was only owing to the fact that the telegraph posts are the property of the Post Office that he could be legally fined for displaying the bills. It would be well if motorists generally were to arrange upon some secret sign which could be erected on the highway to convey the required intelligence. An imitation police helmet on a stick would probably be universally understood, and we do not see that it would be illegal, or improper, if designed merely to protect motorists going at a reasonable rate.

THE WELLER PETROL CARS.—Part II.

(*Continued from page* 607.)

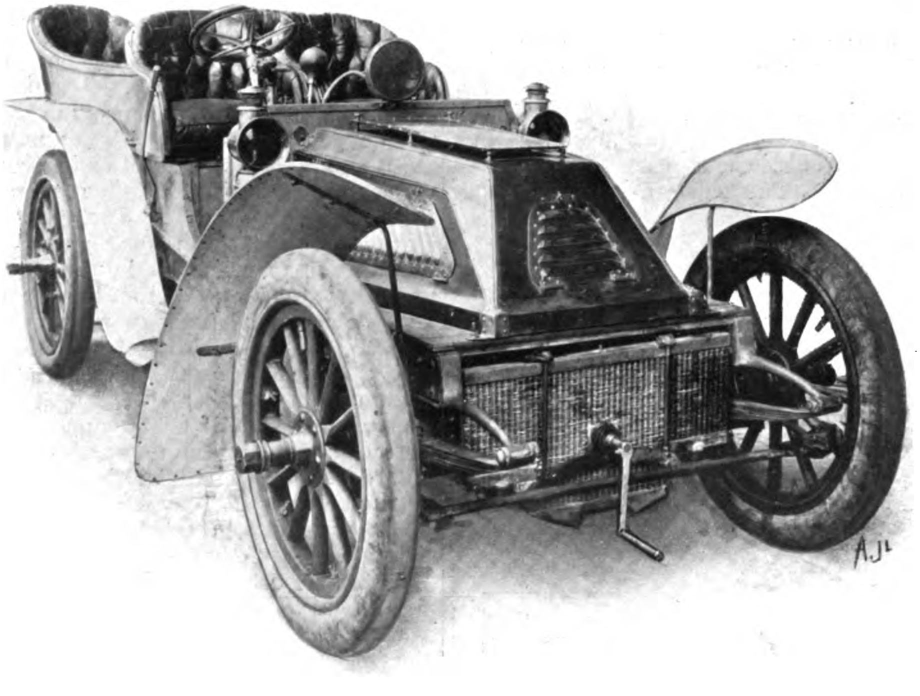


FIG. 5.—Another View of the Weller 4-Cylinder Petrol Car.

THE Weller universal joint is of very simple construction, and will be readily understood by reference to Fig. 6. Each of the shafts which are connected together by it is fitted with forked castings (K^{12}, Fig. 4) having two opposite and projecting arms. A steel plate (K^{13}) is cut out in the shape of a cross, and two of its opposite arms are fixed to the casting, K^{12}, on the one shaft, and its other two opposite arms are connected to the similar fitting on the other shaft. The steel plate gives the necessary flexibility to the coupling, and not only provides for the same movements as an ordinary universal joint, but also permits a certain amount of longitudinal movement between the shafts to take place. Either a single steel plate, or one built up of two or three thinner plates (as shown in Fig. 4) is used. The claims made for this fitting are cheapness of construction, absence of moving parts (in the ordinary sense), and a more thorough provision for universal movement of the one shaft relatively to the other, without interfering with the transmission of power between them.

The change-speed gear provides four speeds. The sliding spur-wheels are mounted in pairs on the first-motion shaft, and the second-motion shaft is mounted immediately above it. The box is made in two portions, M and M^1, (Figs. 2 and 3). The gear is shown in plan, and from the side, in Fig. 7, both these drawings being largely sectional. Each of the sliding pairs of wheels on the first-motion shaft, Q^6, are provided with grooved portions, Q^4 and Q^5, which are engaged by forks, the other ends of which are fitted to sliding rods on either side and at the base of the gear-box; one of these rods, Q^3, is seen in the illustration. The rods themselves are moved longitudinally by means of a disc-cam, Q^1, which lies horizontally in the bottom of the box, and is mounted so that it can be turned about its vertical axis in the bearing provided for it. The sprocket wheel, Q, which is seen in Fig. 3, is fixed beneath the box and is rigid with this cam. The cam is caused to rotate by means of a chain passing around the sprocket, and connecting it with the hand-lever on the steering pillar. A plan view of the cam, Q^1, is given separately in Fig. 7, its shape being clearly shown. The pins, Q^2, are fixed to the sliding rods already referred to, and are both fitted with small rollers which fit into the cam groove.

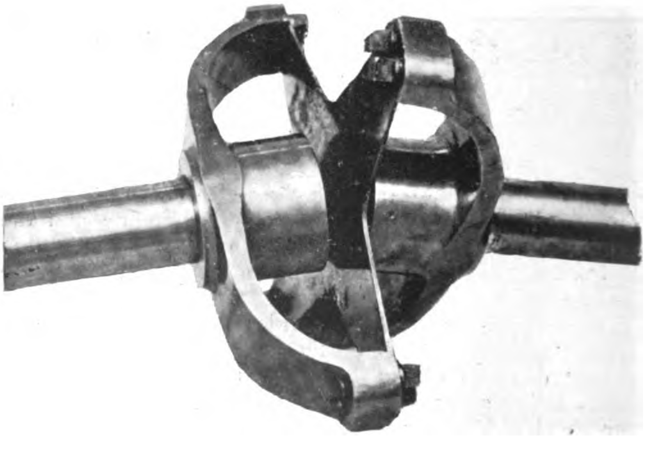


FIG. 6.—The Weller Universal Joint.

As the cam is rotated so the rods, Q^3, are caused to slide in their bearings, with the result that the first, second, third and fourth gears are brought into play successively, and that the first gear is again introduced if the cam is rotated to a further position than that in which it engages the fourth-speed gear-wheel.

The second-motion shaft, Q^7, is built up, as shown in the drawing, the gear-wheels themselves being bolted to a hollow drum over which they register, and which is itself connected by registering joints with those portions of the shaft which form the bearings. The rear end of the shaft is fitted with a hollowed-out bevel-wheel, into which the bearing brasses project, to prevent any overhang; it drives the differential countershaft, N, in the usual manner. The differential gear, N^2, is of the bevel type, and the sleeve, which is rigid with its shell, projects on the left-hand side (although not shown in Fig. 6) to receive the external brake-drum, P (Figs. 2 and 3). The thrust of the bevel-wheels is taken by ball-bearings, that, Q^8, on the second-motion shaft being near the front end of the box, and the thrust-bearing, N^3, on the countershaft being just behind the larger bevel-wheel.

Lubrication of the various parts of the gear-box is effected automatically, the wheels throwing up the oil from the base, and projecting lips being formed in the box for catching it and leading it to the bearings; one of these oil grooves, M^5, is shown. The bevel wheel on the second-motion shaft is also fitted with a "splasher" wheel, which is so constructed as to catch the oil and throw it up into a small chamber, M^4, on the top of the box. From this chamber the oil is led by pipes (M^2 in Figs. 2 and 3) to the bearings which would not otherwise receive a liberal supply of oil. The end bearings for the countershaft are "ring-lubricated."

The brake-band, which acts upon the countershaft brake-drum, is seen in Fig. 8 The brake-shoes, P^1, are made of metal, and are pivotted to a bracket, P^3, which is securely fixed to the underframe. The casting, P^3, was not drilled to receive the pins at the time that our photograph was taken, but it is obvious how the parts, P^1, are pivotted to it. The upper ends of the shoes, P^1, interlock with one another, and are so arranged that spiral springs normally tend to keep them apart. The ends of the shoes are connected together by links, P^4, which are hinged together by the fulcrum pin, P^2. The brake is applied by the forked arm of a lever, the forked ends of which engage with the pin, P^2, and force it downwards when the lever is operated by the foot pedal. The object of this method of connection is that it enables the underframe to be removed without necessitating the disconnection of the lever operating the brake, for the pin, P^2, slides downward freely out of the forked ends of the lever, and allows the lever itself to remain in place on the main frame.

Fig. 9 shows the regulating levers and pedals. The change-speed-lever, R, is mounted horizontally about the top of a vertical tube which passes up through the floor, and is fixed to the steering pillar. A shaft which passes through the tube carries the notched wheel, R^2, at its upper end, and

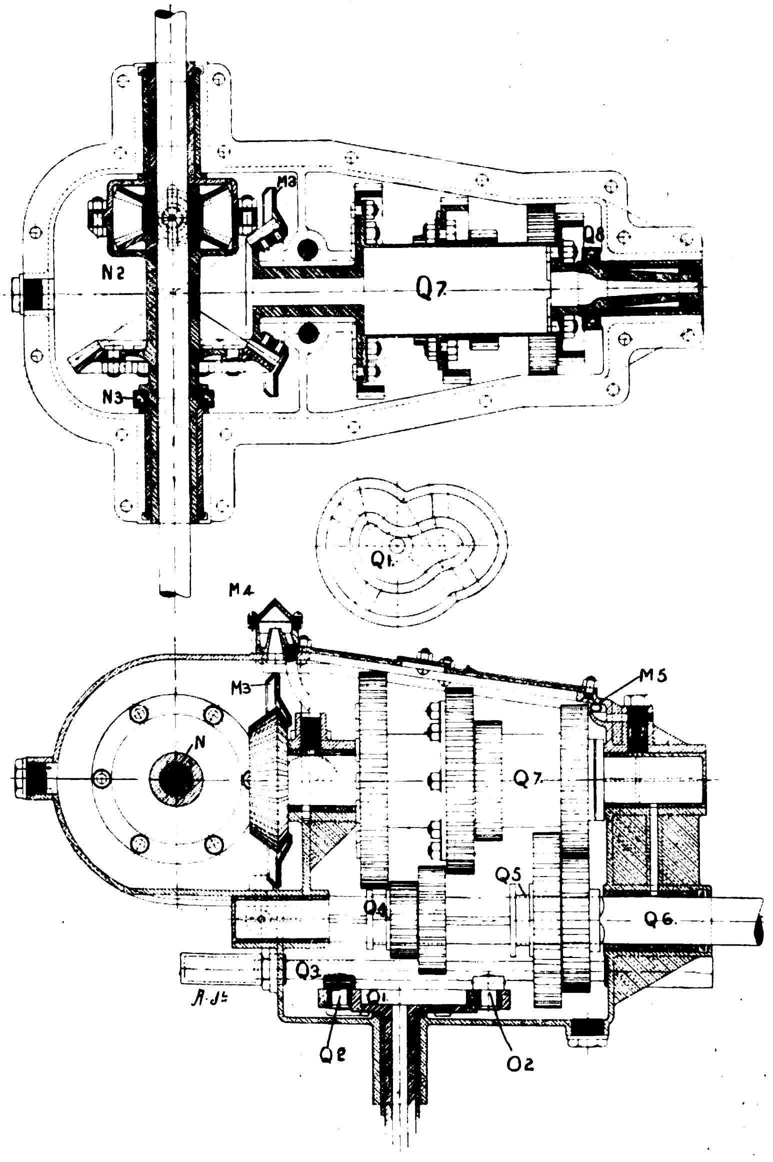


FIG. 7.—Plan and Side View of Change-speed Gear.

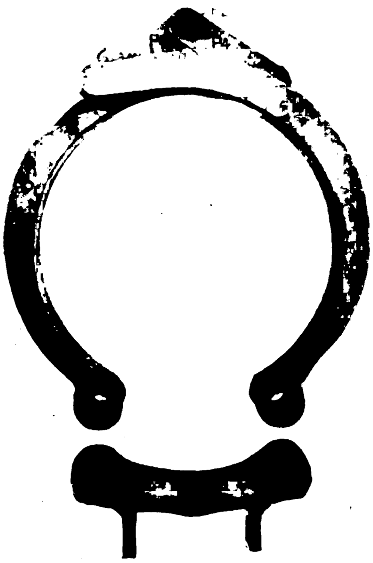


FIG. 8.—Countershaft Brake.

a sprocket, from which the chain passes to the gear-box, at its lower end, beneath the car. The hand-lever, R, has a spring catch lever, R^1, fitted to it, the catch engaging with the notches in the wheel, R^2. The catch lever, R^1, can be raised by the fingers when the hand is placed on the lever, R ; when raised it disengages the lever from the wheel, R^2, but when released these two parts are locked together. In this manner the wheel, R^2, can be rotated ratchet-fashion, and the various speeds in the gear-box engaged at will. The position of the wheel, R^2, indicates to the driver which gear is in use.

The small levers, G^3 and U^3, on the steering-pillar, act upon the engine-governor and regulate the time of ignition, respectively. The latter is connected by Bowden wires to the commutator, and the commutator is neatly fitted on the dash beneath the glass-fronted cover, U. The ignition coils are contained in the case, U^1, this box, and also the sight-feed lubricator, V, being fixed on either side of the dash. The foot-pedals, which operate the side-brakes and the combined clutch and reverse gear, are visible in Fig 9, as also is the emergency brake lever, P^5, which applies the countershaft brake. The side-brakes are fitted to the hubs of the rear wheels, and are of the internal expanding type ; the expanding members are forced outwardly by means of cams, and are extremely powerful ; they are operated by Bowden wires.

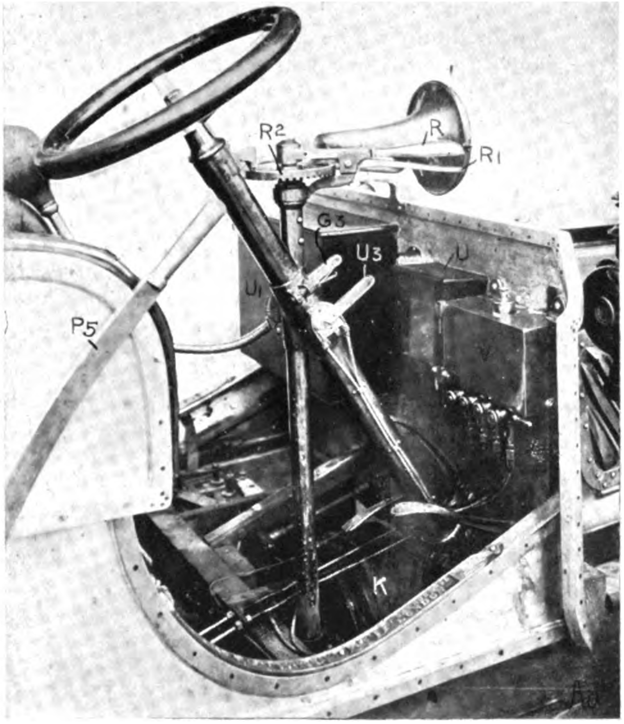


FIG. 9.—View of Regulating Levers and Pedals.

The casing enclosing the steering gear, at the base of the pillar, is seen open in Fig. 10, and a horizontal section through it is given in Fig. 11. The rod, T, which carries the wheel at its upper end is fitted with the worm, T^1, and is mounted in long bearings in such a manner that all end-play can be taken up by means of the set screw, T^2, and its lock nut.

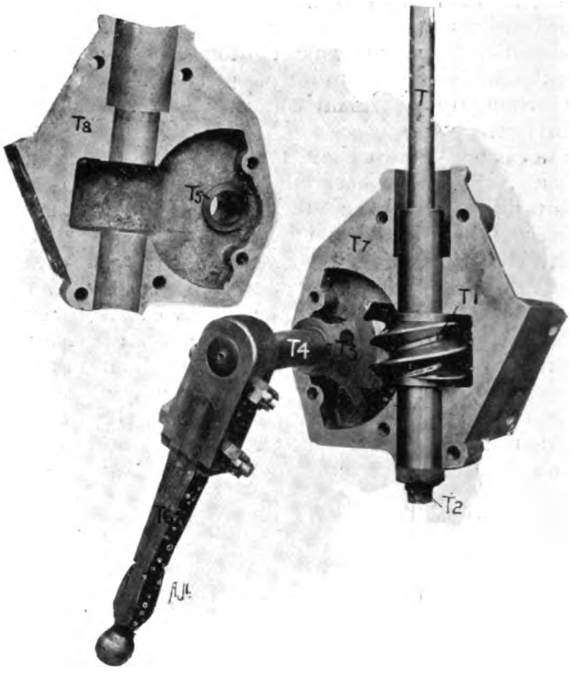


FIG. 10.—The Weller Steering-Gear.

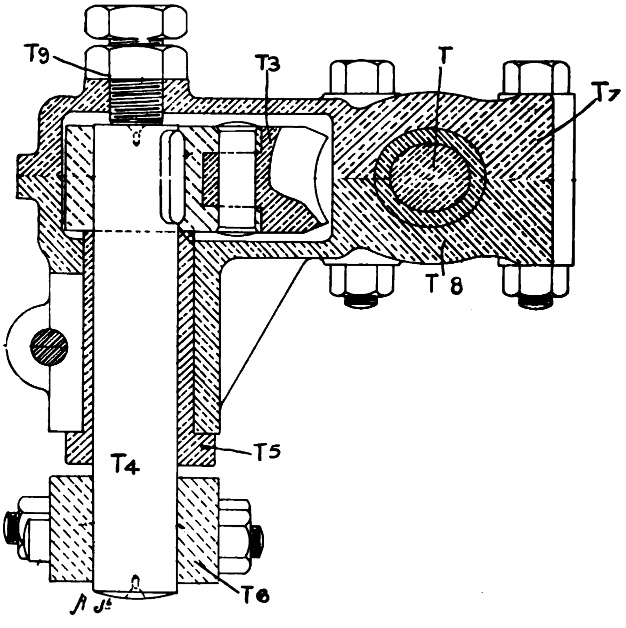


FIG. 11.—Horizontal Cross-section through Steering-Gear.

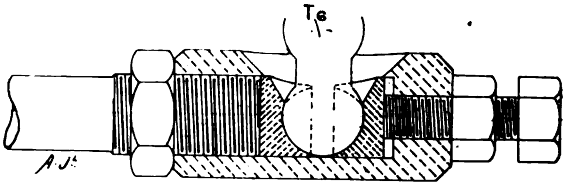


FIG. 12.—Section of Ball Socket Connecter.

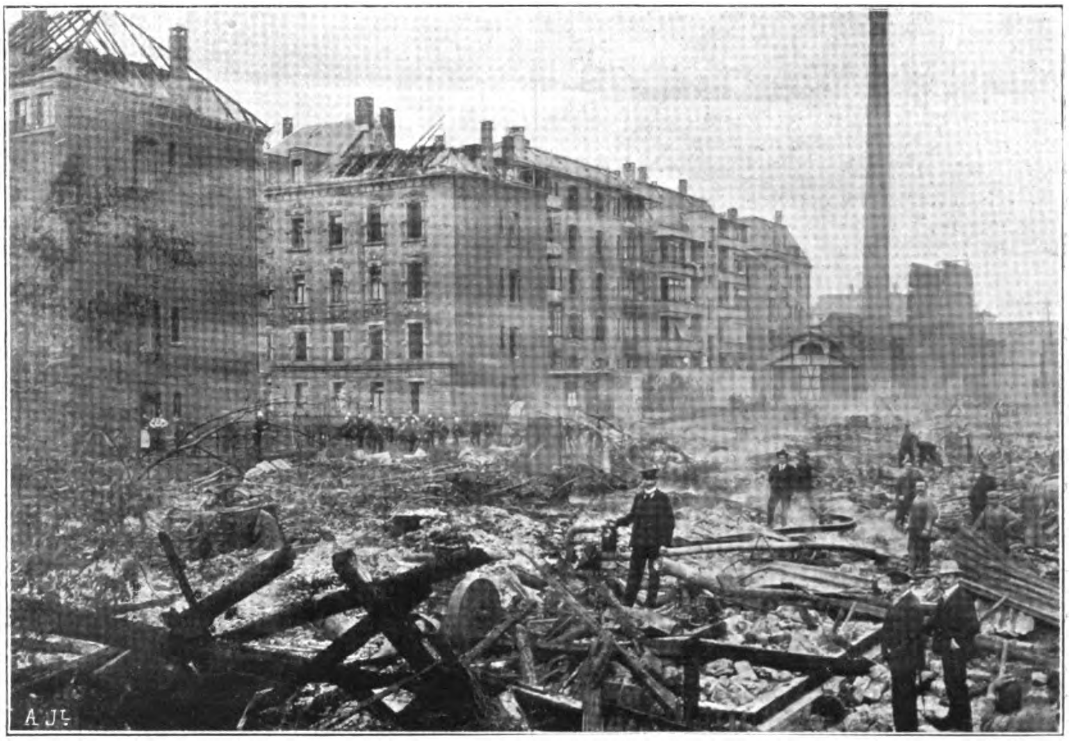
The gears have very deep V-shaped teeth. The worm-wheel segment, T^3, which engages with the worm, T^1, is fixed to the short shaft, T^4. The shaft, T^4, is carried in a brass bush, T^5, which is eccentric, and the shaft is prevented from moving longitudinally by means of the lock-nutted set screw, T^9. The eccentric bush, T^5, can be twisted round in the casting, T^8, so that the segment, T^3, can be brought accurately into mesh with the worm, T^1. By the construction adopted it is possible to take up any wear which may occur in any part of the gear, and thus to entirely prevent backlash, even after prolonged use. The eccentric bush, T^5, is locked in the required position by means of a bolt which tightens that portion of the casting, T^8, in which it fits, thus holding it securely, the casting being split at this point and provided with lugs for receiving the bolt. The two halves, T^7 and T^8, of the casing are held together by bolts, and are rigidly fixed to the main frame of the car; the rigidity of the steering pillar is further increased by the vertical tube carrying the change-speed-lever. The lever-arm, T^6, which is fixed to the outer end of the shaft, T^4, is built up with spring-steel plates in such a manner as to render it slightly flexible and thus to enable it to absorb such shocks as would otherwise be transmitted from the steering wheels to the steering gear. The lower end of the lever, T^6, is ball-shaped to receive the ball-socket (Fig. 12), which forms the end of the rod connecting the steering gear with the heads of the front wheels. It will be noticed that the ball-socket is so made as to be also adjustable for wear.

The steering heads carrying the front wheels are so constructed that the axis of the head slopes outward and forward, downwardly, instead of being vertical, as it generally is. By this means the wheels turn about the point of contact of the tyre with the road when steering, and the shocks which are imparted through the wheel and the stub-axle, when the former meets an obstacle, are taken almost longitudinally by the head. The front axle connecting the heads together is bent upward instead of downward, so that it passes across over the under-frame, and thus allows the under-frame to be let down for removal.

(*To be concluded with a full description of the engine.*)

* * *

FROM New York by cable comes the announcement that, under the title of the Association of Licensed Automobile Manufacturers, an organisation has been registered with a capital of 14 millions sterling to control the motor industry in the United States. There are 19 manufacturers of petrol cars who have signed the necessary combination agreement for a period of nine years. This is no doubt the combination of manufacturers in connection with the Selden patent, particulars of which we gave about six weeks ago.



The Cannstatt-Daimler Fire.—The photograph which we reproduce of the site of the Cannstatt-Daimler works after the fire, the burning of which we recorded last week, conveys some idea of how utterly disastrous the conflagration was. Beyond one or two minor departments, practically the entire factory has been consumed. The buildings themselves were quite unworthy of the reputation of the Daimler Company, and elaborate plans had already been passed for the construction of entirely new works more suitable to the advances made in recent years by this great engineering firm. These of course are now to be pushed forward, and it is hoped that the delay under these circumstances in getting back into the supplying stage will not be so severely felt as might have been expected under all the circumstances. Fortunately, we understand that the principal patterns were at the time of the fire in the foundry and are therefore available for immediate use.

A PAIR OF TWO-STROKE ENGINES.

WE give illustrations below of two of the most recent attempts to construct light engines on the two-stroke principle.

Fig. 1 shows the Bichrone bicycle motor, which has already become generally known. Fig. 2 is an American construction on much the same principle, though differing slightly in structural detail. The Bichrone motor, as will be observed, consists of two cylinders connected to a common crank chamber, and mounted relatively to one another at an angle of 70 degrees, the cranks being opposite to one another. The cylinder shown in a vertical position is the actual working cylinder, while the cylinder in a nearly horizontal position is the compressor or auxiliary cylinder in which the explosive mixture is prepared and subjected to preliminary compression. The carburettor, which is shown to the left hand of the compressor cylinder, supplies explosive mixture through the admission valve of that cylinder on the suction stroke. The explosive mixture is partly compressed on the return stroke through the curved tube connecting the two cylinders till it opens the admission valve of the vertical working cylinder, which it does towards the end of the compression stroke, the mixture being fired by electric spark in the working cylinder. As will be seen, the working cylinder has no exhaust valve, the burnt gases escaping through an exhaust port in the side of the cylinder, which is disclosed by the piston at the end of the working stroke.

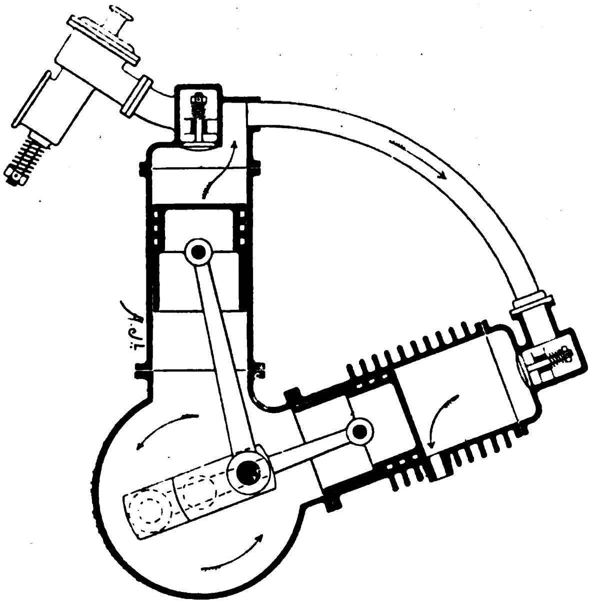


FIG. 1.—Section of the Bichrone 2-Cycle Petrol Motor.

A slight scouring effect is got in this engine. But it is a disadvantage that the compressed gases have to pass through such a considerable length of tube between the compression cylinder and the working cylinder, as it limits the effectiveness of the compression which can be attached and also gives rise to loss of heat.

This disadvantage is not present in the American engine shown in Fig. 2, where both cylinders are vertical, the right-hand cylinder being the working cylinder, which is water-jacketed. The crank is set at an angle of 45. The general principle upon which this engine operates is the same as in the Bichrone motor. Explosive mixture is admitted through the induction valve on the left, and compressed by the upward movement of the piston, till it opens the valve on the right-hand side, through which it passes into the working cylinder at the end of the compression stroke, and is there electrically fired.

The latter engine differs from the Bichrone in having an ordinary exhaust valve which, however, is so arranged as rather to diminish the scavenging effect of the incoming mixture, and to promote loss of the working charge, while a great portion of the explosion space, owing to the position of the valve, takes the unsatisfactory form of a bent tube, the valve being really at the wrong end of that tube, and not at the cylinder end as in the Bichrone.

Previous attempts to solve the two-stroke problem have generally consisted in the adoption of means for bestowing the preliminary compression upon the charge in the crank-chamber. We probably owe the two designs which we illustrate to the difficulty of preventing leakage in these methods of construction, and to the fact that the compression does not take place quite at the right moment.

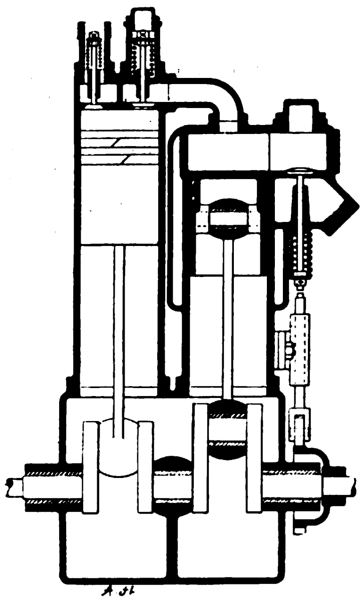


FIG. 2.—Section of an American 2-Cycle Petrol Motor.

In neither of these engines does very much appear to be gained by the use of the auxiliary cylinder. The auxiliary cylinder is practically as big as the working cylinder, and the whole machine must cost very little less than a two-cylinder 4-stroke engine of the same size. The Bichrone engine saves two valves and one ignition plug. The other engine economises one valve and plug only.

THE June meeting of the Aeronautical Institute and Club was held as usual at the St. Bride's Institute, on the 11th instant, when a paper was read by Mr. Middleton—mainly devoted to the mathematical aspects of the subject—on the "Fundamental Principles" of Aerial Locomotion. Mr. Middleton, in his paper, pointed out that there is still a considerable want of agreement among different authorities as regards the amount of power required to raise and propel machines of the aeroplane type in the air. At the July meeting a paper will be read on the "Navigable Balloon, its Various Improvements and Capabilities."

PATENTS FROM THE MANUFACTURERS' POINT OF VIEW.

(*Continued from page* 505.)

The services of the technical expert in these preliminaries are as important to the defence as to the plaintiff. In preparing and dealing with particulars of objections they are almost more so. As already pointed out, the success or failure of the defence is almost entirely dependent on the collection of particulars of objections, and, next to their collection, on the manner in which the main features of the alleged anticipation are put before counsel and adequately hammered into their heads. It does not conduce to the satisfactory issue of a case when the leader has to be frequently pulled down by the streamers of his gown and whispered to in stage asides by his juniors and experts, particularly if he, after that, starts off upon a fresh line of argument more or less inconsistent with that which he was previously advancing. At the risk of some repetition, therefore, we would urge upon litigants, and particularly defendants, the enormous importance of insuring that the case is well got up by the technical expert in charge of it, and that the counsel engaged really benefit by his labours.

It generally happens in cases of patent litigation that there are a considerable number of infringers to be proceeded against. The usual practice at present is to threaten them all and afterwards proceed against one of them. Or several of them may be writted and the arrangement made, with the consent of the Court, that one action shall be tried and the others stand over until it has been decided, the defendants in that case undertaking to be bound by the result of the first action. Another method of procedure is for the plaintiff to proceed against all the infringers, and to carry on the action against several of them at the same time. This will be nearly sure to result in an order for consolidation of the actions, the defendants naturally desiring to join their resources and diminish expense. In discussing which of these methods of procedure it is better for the plaintiff to adopt, it must be borne in mind that to commence and prosecute a number of independent actions involves much greater original expenditure, and that is probably the reason that it is seldom resorted to. On the other hand the plaintiff gains a certain tactical advantage if he can manœuvre the defendants into a consolidation. If the decision in the Court of First Instance goes in his favour the consolidated defendants would have all to agree if they want to lodge an appeal. If there are a good number of them there is a possibility of some of them refusing to do so. If the decision, however, in the first instance goes against him the plaintiff can appeal alone.

It is not an uncommon occurrence for an alleged infringer to be indemnified by a manufacturer against possible actions for infringement which may arise through his having purchased articles from the manufacturer which are alleged to be infringements of somebody else's patent. Manufacturers who have plenty of funds, and who do not believe that the articles they are selling are infringements of any valid patents, occasionally reassure nervous customers in this way. They indemnify him against the expense of any action to which he may be subjected, or against damages which may be declared against him. The customer, however, will not escape the enjoyments of a legal action through this indemnity. The action can be brought against him, the manufacturer who has indemnified him being brought in under what is known as the third party rule, and made a co-defendant. Any customer who desires to obtain an indemnity of this kind from a manufacturer should take care that the indemnity has been given him before action commences; it will not do for him to be put off with a promise that if anybody brings an action against him the manufacturer will then give him an indemnity, as in the case of the Edison-Swan Company *v.* Holland it was held that an indemnifier from whom no indemnity was obtained until commencement of action should not be brought in as third party.

Revocation.—As far as the action for infringement is concerned it is essential that it should be initiated by a patentee, and if that were the only legal action by which a patent could be tested, the owner of a patent might go on preserving his patent indefinitely by refraining from procedure against powerful infringers whilst using his patent against small manufacturers, from whom he might be able to extract royalties by the threat of action. The law has provided a means by which the validity of a patent can be tested on behalf of the public, even where the patentee has not brought any action for infringement. This is by petition for revocation.

A manufacturer in any particular line may often find his business interfered with by the existence of a patent even though the owner of it has not menaced him in any way. Or the existence of such a patent may, by hanging like a suspended threat, interfere with the general progress of some particular industry. The action for revocation exists for the purpose of enabling any hardship or injustice that may arise in this way to be redressed.

An action for revocation is looked upon by the law as a process adopted on behalf of the public. A petition for revocation cannot, however, be presented by everybody. The petitioner must have some *locus standi* or else he must adopt the procedure of what is known generally as "setting the Attorney-General in motion" as the guardian of public interests. Certain persons, however, can present the petition to the Court directly without having previously had to obtain the fiat of the Attorney-General. These are:—

Any person alleging that he, or any person through whom he claims, was the true inventor of any invention included in the claim of the patentee.

Any person alleging that, or any person under or through whom he claims an interest in any trade, business, or manufacture, had publicly manufactured, used, or sold, within the realm, before the date of the patent, anything claimed by the patentee as his invention.

Any other person desiring to act in his own or the public interest, who is not in a position to support one or other of these allegations, must procure the fiat of the Attorney-General, for which a certain amount of formality, payment of fees, documents on judicature paper, and red tape are necessary. Such matters must, of course, be left as purely professional business for lawyers, but it is important to bear in mind that the petitioner must make out a case, and that the Attorney-General, before granting his fiat, may summon the patentee, or permit him on his own application, to appear against the petitioner.

Once the petition has been granted the action proceeds very much like an infringement action, because, in addition to the two grounds alleged above, it is open to the petitioner to bring forward in support of his petition anything against the validity of the patent which would naturally be alleged by a defendant in an infringement action. The only difference is the defendant has the right to commence.

(*To be continued.*)

REVIEWS OF BOOKS.

"Encyclopædia Britannica," 10th edition, vol. 6, being vol. 30 of the complete work. (Adam and Charles Black, Edinburgh and London; and *The Times*, Printing House Square, London.) *Kabadian* to *Morvi.*

This volume of the "Encyclopædia Britannica," 10th edition, which is uniform with its predecessors, and maintains the high standard of excellence both in subject matter and illustrations which characterises the other volumes, unfortunately contains few articles of special interest to the automobilist. Amongst the few that possess a direct or indirect connection with the subject with which we usually deal may be mentioned the admirable article on Kites, by Major Baden-Powell. This article is confined to the subject of military kites and to the extensive series of experiments which have been made in their use for military signalling and allied purposes by the author. The general aeronautical aspects of the kite regarded as an aeroplane are included, as will be remembered, in Mr. Chanute's article in an earlier volume on Aeronautics. Not without interest also to automobilists and manufacturers who have specialised in electricity will be found the short life of Lord Kelvin, which gives a succinct though necessarily very condensed account of the marvellous series of discoveries and researches which constitute his great scientific record. An admirably comprehensive article by His Honour Judge Francis William Raikes on Liens may attract automobilists, for liens constitute a claim of any workman or manufacturer who repairs or does work upon an article to retain the same until he has secured payment, a condition which not unfrequently arises in the case of motor vehicles. Other articles of indirect interest are Magnetism, by Dr. Shelford Bidwell; Magneto Optics, by Professor J. J. Thompson, of Cambridge—its leading exponent; Measuring Instruments, by Dr. J. A. Fleming; and Liquid Gases—that subject which he has made peculiarly his own—by Professor Dewar. The article on Lubrication, which is the one subject in this volume to which the automobile engineer will be likely first to turn, is, unfortunately for him, treated only from its theoretical aspects, no practical illustrations of recent improvements in lubrication being provided. As far as it goes, however, the article is exceedingly clear, and constitutes an admirable exposition of the principles to the application of which recent progress is entirely due. The admirable article on Metallography by Professor Roberts Austin has unfortunately got omitted from the table of principal contents, and an article on Metallurgy by the same author there entered does not appear in the text. The article on Metallography, excellently illustrated as it is with examples of the grain of various metals and alloys, is of considerable interest to every engineer. Accumulator manufacturers will also turn to the useful article on the manufacture of lead by Professor Hofman, of Massachusetts. Other articles deserving special mention are the excellent descriptions of electric measuring instruments with the methods of using them, by Professor Fleming, an article which, like that on Metallography above referred to, has unaccountably escaped insertion in the table of contents. An excellent description of the general principles of calculating machines is also given by Professor Henrici, under the heading of Mathematical Instruments. The article on Letters Patent has little to do with patent law, that subject being reserved for treatment under the heading of Patents, and it merely deals with the granting of the actual letters patent, whether for inventions, patents of nobility, or other appointments. Of general literary interest will be found biographical articles on Lord Leighton, William Morris, Millais, and Count Moltke, while most people will peruse with interest the well-illustrated description of machine guns by Major Barlow. The volume is prefaced by an essay on the modern conditions of literary production, from the sprightly pen of Mr. Augustine Birrell, K.C. The essay is exceedingly refreshing, caustic, epigrammatic, and sometimes almost mordant, and flits over the general literary output of the country for the last fifty years and more. It brings out with much force the enormous mass of the literature which is now daily produced, and throws into relief the totally different conditions under which it originates from those under which the writers of almost every other age have worked, but it leaves us pretty much where we were at the start, and very naturally refrains from indicating what the ultimate tendencies may be.

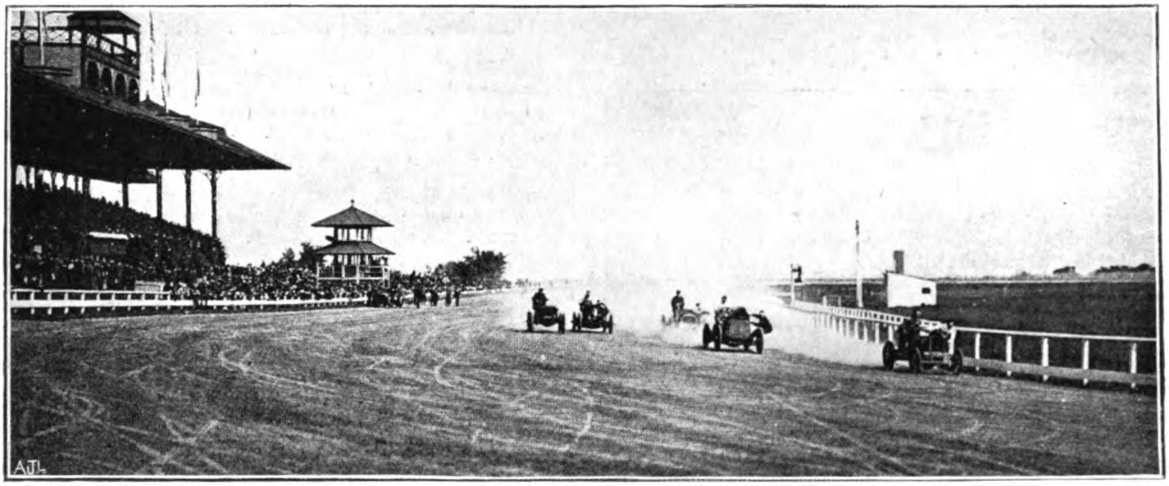
"Black's Guide to Ireland." Edited by R. T. Laing. Illustrated with maps, plans, &c. 5th Edition. 1*s.* (London: Adam and Charles Black.)

This is the best general guide book to Ireland that we have come across, and in view of the approach of the Gordon-Bennett Race and the Irish Fortnight, ought to prove of interest to a large number of automobilists visiting the country. It is well and readably written throughout. It is copiously provided with excellent maps and gives a very clear account of the large number of itineraries through the most picturesque districts of the island. Unfortunately, the present edition was got in hand before the Gordon-Bennett Race had been arranged for, and consequently there is no special reference to the Gordon-Bennett course, though the principal towns through which it runs are adequately dealt with. The other districts in which events will take place, notably the neighbourhood of Cork, Killarney, Belfast, and Dublin, are fully described and illustrated. A pleasant feature of the book are the light and succinct historical annotations, which are just what the tourist wants and are not too long-winded. Altogether we can thoroughly recommend the work to anyone desirous of visiting Ireland, and we feel sure that automobilists crossing for the Irish Fortnight will do well to provide themselves with a copy.

"Cyclists' and Motorists' Guide, North of England." "Cyclists' and Motorists' Guide, North Wales, Cheshire, and Shropshire, including Aberystwyth." (T. Throup, 27, Fairbank Road, Bradford.)

These marvellous little publications, which are sold for the modest price of 6*d.*, are calculated to be of the greatest assistance both to motorists and cyclists. Each is provided with a good map of the districts with which they deal, and comprises a very extensive itinerary dealing with all the main roads and routes that anybody is likely to desire to travel along. Not only this, but in addition to the distances given in the itinerary, information as regards the roads, gradients, and the like, a compressed but remarkably well-illustrated guide-book to the district is also included. All that the little works seem in any way to need is an index at the end, but one cannot expect everything for 6*d.*

RACES, RECORDS, AND TRIALS.



Empire City Track Meeting.—Cars rounding a corner in the 5-Mile Event. The mechanicians are seen "in position," helping the balance of the cars.

TWO gold medals are to be presented by the Society of Motor Manufacturers and Traders in connection with the Light Van Trials being organised by the Automobile Club in 1904.

IN order not to clash with the Circuit des Ardennes, the Rhone Automobile Club have, in connection with the Aix-les-Bains Meeting, wisely postponed their three days' Tourist Trial until the 25th, 26th, and 27th instant, thus enabling competitors in the Circuit, if they desire, to take part in both these important events. The Aix Automobile Paperchase will be put forward to the 23rd.

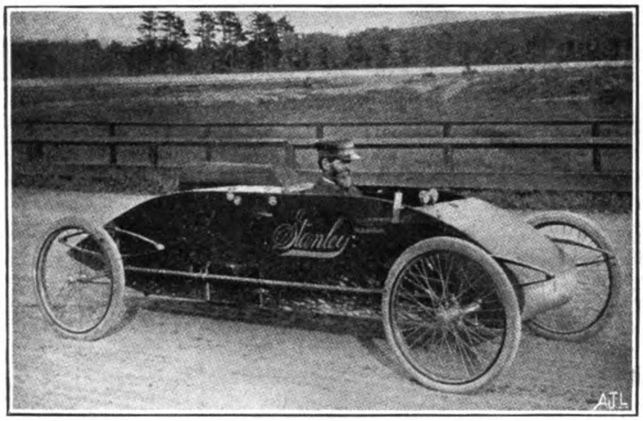
FROM New York the announcement comes by cable that a world's cycle record for a paced 5 miles has been made in 8 mins. $6\frac{3}{5}$ secs. At the same time the National Cyclists' Union of Great Britain has decided that no further permits will be granted at present for motor pacing in amateur events, and where permits have already been granted these are to be cancelled. Motor pacing will be allowed in club events subject to conditions which are to be drawn up by the Sub-committee of the Union.

A THREE days' endurance run for motor cycles, promoted jointly by the New York Motor Cycle Club and the Metropole Cycling Club, is to be run off between New York and Boston. The contest will commence at 5 a.m. on July 3rd, the run being to Palmer, Mass. The next day the competitors will travel to Boston and back to Palmer; the final day, July 5th, the finishing point will be again New York. Evidently an army of competitors is anticipated, as it is notified that the start will be made in fives at half-minute intervals.

A CROWD of about 5,000 people and 200 motor cars attended the Empire City Mile Track at Yonkers, U.S.A., on May 30th, when some sensational performances were forecast. The particular attraction held out was a 5-mile match between Barney Oldfield and C. G. Wridgway on the Ford and Peerless racers respectively. The Peerless car was to have been the 90-h.p. Gordon-Bennett racer, but, unfortunately, at the last minute it was found impossible to run this, and Wridgway, therefore, had to content himself with pitting the 40-h.p. Peerless against the 70-h.p. Cooper-Ford machine, driven by Barney Oldfield. The terms of the test were the best two out of three heats of five miles. Oldfield's machine easily secured the race in the first two tries. In the first heat no particular high speed was attained, but on the second occasion Oldfield lowered the world's track record for the mile to 1 min. $1\frac{3}{5}$ secs. and the five miles to 5 mins. 31 secs., in spite of the fact that he thought it advisable in travelling round the track to keep well on the outside all the way round, the excess in distance over the mile being stated to be nearly 100 yards. The only other notable performance was some new motor cycle records made by Albert Champion. His record times for the 5 miles were as follows:—1 mile, 1 min. $4\frac{1}{5}$ secs.; 2 miles, 2 mins. $9\frac{4}{5}$ secs.: 3 miles, 3 mins. $15\frac{3}{5}$ secs.; 4 miles, 4 mins. $21\frac{4}{5}$ secs.; 5 miles, 5 mins. 35 secs.

Circuit des Ardennes.—The new conditions under which this event will be run will leave little fear that any accidents of a serious nature are likely to occur. All traffic will be rigorously excluded from the road on both the 22nd and the 23rd, the various abutting roads being closed to all vehicular traffic. Children, it has been arranged throughout the Circuit, will, like last year, be in charge of the village schoolmasters. On the 22nd the heavy cars will start at 3 a.m. from Bastogne, and the control will close for these at mid-day. Half an hour after noon the light cars will start, the control for these closing at 8.30 p.m. These two classes will cover the circuit of 85·400 kiloms. six times = 512·400 kiloms. On the 23rd, the next day, the voiturettes will be sent off, commencing at 7 a.m., the control closing at one o'clock. At that hour the motor bicycles will be despatched, their latest time for closing being at 7 p.m. These classes, starting from Arlon, go round the circuit twice only. The starters are limited to three vehicles of the same make. The entries, at the close of the lists, totalled up to 122. Amongst these, however, are quite a number who it is obvious have no intention whatever of starting. The De Dietrich firm have given formal notice of withdrawal, and there is a possibility the Mors Company will not run their cars. Altogether, in spite of the dates for the Tourist Trial in connection with the Aix-les-Bains fortnight having been altered to commence on the 25th, it is quite possible that the Circuit will prove but a modified success. A special train will be again run similar to last year, affording sleeping accommodation for those who are fortunate enough to secure seats.

ORGANISED by the Massachusetts Automobile Club an automobile meet was held at Boston on the Readville Trotting Track, when a number of interesting items induced an enormous crowd to assemble, estimated to number about 15,000 people. Interest centred in the two steam racing machines, owned respectively by F. E. Stanley, of Newtown, and George Cannon, of Harvard University, and great results were anticipated from these two racers. Cannon, on this "Freak" machine, which this year is mainly built of aluminium, however, although beating his own previous record of last year by covering a mile in 1 min. 4⅖ secs., was unable to catch up to the splendid time for the mile of 1 min. 2⅘ secs. of the Stanley "Torpedo." The intermediate times for the Stanley vehicle were :—Quarter-mile, 16 secs. ; half-mile, 31⅕ secs. ; three-quarters, 46⅖ secs.



Readville Track Races.—The New Stanley Steam Racer which covered the mile in 1 min. 2⅘ secs.

Mr. R. Moffat Ford, dealing with the subject of the heated correspondence concerning the crying need for fresh legislation for motors which is now appearing in the daily papers, has sent us copies of some suggested "bills" embodying the widely divergent views of the various correspondents. The following text of an "Anti-Motorist's Bill" is rather amusing :

Be it enacted, etc. :—

1. This Act may be cited as the "Protection of the Public Against Light Locomotives Anywhere Act, 1904."

2. The Locomotives on Highways Act, 1896, is hereby repealed.

3. Every light locomotive shall be required to carry a metal plate, not exceeding six feet in length, three feet in width, and three inches in thickness, upon which shall be legibly engraved, painted, chiselled, or inscribed a distinguishing number, a broad arrow, a photograph of the owner, and a copy of the certificate of his birth. In addition, every light locomotive shall carry, permanently affixed to the car, a banner, not exceeding six feet in length or three feet in width, upon each side of which shall be painted, drawn, or depicted upon a conspicuous part thereof, in white upon black or black upon white, the eyes not to be less than six inches across, a full-sized skull and cross-bones.

4. The driver of every light locomotive shall be furnished with a certificate of competency after passing an examination by the Senior Cambridge Local Centre, the Agricultural Board of Trade, the St. John Ambulance Society, and the Commissioners in Lunacy.

5. Any person in charge of a light locomotive who neglects or refuses to stop on the demand of any person or persons whatever wishing to know the time or to enquire, their way ; or of any child or children wishing to whip a top or tops, or to bowl a hoop or hoops, or to play marbles, hop-scotch, or shove-ha'penny in the roadway, shall be liable to a term of imprisonment not exceeding the term of his natural life.

6. Any driver of a light locomotive, provided the said locomotive is labelled as required, and that he himself has thoroughly satisfied the Senior Cambridge Local Centre, the Board of Agriculture, the St. John Ambulance Society, and the Commissioners in Lunacy of his competency as a driver, may drive his car, at a speed not exceeding six miles an hour, in any lane, cul-de-sac, blind alley, yard, back garden, or ploughed field, provided always that he has already obtained the permission of the owners to do so.

7. Any driver of a light locomotive found, seen, discovered, or known to be driving or to have driven his light locomotive upon any highway, byway, subway, or public thoroughfare originally constructed for the purposes of general traffic shall be instantly shot by sportsmen duly authorised by Sir Ralph Payne-Galloway for the purpose, the shot used to be not less than buck-shot.

CLUB DOINGS.

Oxford and District Automobile Club.—Fine and sunny weather favoured the run of this Club to Banbury, a distance of about 22 miles, last Saturday, enabling the unequalled scenery of the district to be appreciated to its full extent. A fairly good attendance of members resulted at the start from the Clarendon Hotel, amongst those taking part being the President (Mr. C. Rippon), the Hon. Secretary (Mr. W. L. Creyke), Mr. N. G. Ravenor (Witney), Dr. Daly (Kingston Bagpuize), and Dr. Collier (Oxford). Mr. Ravenor, who was accompanied by Mrs. Ravenor and their two juvenile sons, travelled on his 10-h.p. Gladiator ; the President, with Mrs. Rippon and Mr. Walker, on his 8-h.p. M.M.C. ; the Hon. Secretary, with Mr. Percy Hall, on his 30-h.p. Panhard ; Mr. F. G. Barton, with Mrs. Barton, Mr. Barton, junr., and Mr. J. Sherratt, on a 12-h.p, M.M.C. ; and Mr. Allman and M. G. Strangward (Kilburn) on an 8-h.p. Renault. On the outward journey very fast times were not expected, as the road nearly the whole way is marked by a steady rise. Deddington Hill was expected to be somewhat of a trial for some of the cars, but as it proved not the smallest difficulty was noticed in overcoming this rather severe test. Such cars as Mr. Creyke's Panhard naturally showed to advantage upon the occasion, although throughout the run great care was taken that a moderate pace was maintained. The White Horse Hotel at Banbury was selected for tea, and the return journey, after the quaint sights of Banbury had been inspected, was accomplished without any incident to mar the success of the day's outing.

Midland Automobile Club.—Moor Court, Oakamoor, North Staffs., the residence of Mr. F. A. Bolton, is the destination for the Club run this (Saturday) afternoon. Nominally tea will be partaken of at 4 o'clock, but Mr. Bolton will be only too pleased to see members arrive any time before that hour. The route suggested from Birmingham is Lichfield, Abbots Bromley, Uttoxeter, Rocester, and Alton. As a little difficulty may be experienced in finding the right road from Rocester to Moor Court, a distance of about six miles, Mr. Bolton has arranged for men to indicate the way at the corner of each of the cross roads. In addition, he proposes himself to meet the early arrivals and pilot them personally to Oakamoor.

The headquarters of this Club for the Gordon-Bennett Race will be the Golfers' Hotel, Sutton, where special arrangements have been made by the Committee for special accommodation of the members of the Club. Members journeying to Ireland will leave Birmingham at 10.15 p.m. on the 29th inst., reaching Dublin the next morning at 6 a.m. Members' cars will precede them on Saturday, the 27th inst. The Committee have decided upon going fully into the matter that no special Club Enclosure will be provided, but members are recommended to take advantage of the Automobile Club Enclosure at Ballyshannon, for which entrance tickets can be obtained at one guinea per head, this charge including lunch and light refreshments.

Scottish Automobile Club. Western Section.— About thirty cars took part in last Saturday's meet of members of this Club, when a run was made to Tarbet, Loch Lomond. Fortunately the day was fine, although cold, and enabled the visitors to thoroughly appreciate the glories of the famous Loch. The route selected by the majority of the Glasgow cars, both in and out, was *viâ* Alexandria and Luss. A few, however, selected Garelochhead and the much-dreaded Whistlefield Hill, a circumstance which is notable, as the difficulties in surmounting this rise are still fresh in the memory of most automobilists who took part in the Glasgow Trials a couple of years back. There were no less than seven Wolseleys taking part in the outing, and amongst those who brought their cars were Mr. J. Adam, of Glasgow, Mr. Wm. Weir, Mr. J. W. Drysdale, and Mr. H. Barbour (on a 22-h.p. Daimler) who had come over from Ireland.

Reading Automobile Club.—The amount of energy and enterprise displayed by this club is extremely praiseworthy. The executive committee are continually arranging special trials in addition to the ordinary pleasant afternoon runs which constitute the chief attraction of the majority of the provincial automobile associations. Last Saturday a hill-climbing contest was decided in the afternoon on Peppard Hill, when the programme was gone through in spite of the phenomenal downpour of rain which continued during the whole of the meeting. This hill is an extremely steep one, and the worst that could possibly be found in the neighbourhood. The distance selected for trial was about 300 yards in length, and includes gradients of 1 in 6, 7, 8½, 10 and up to 40 ft. A standing start was the order of the day, and in no case was there the smallest difficulty experienced in taking the hill at a fair speed. Mr. J. Paxton Petty acted as starter, and the time-keeping was in the hands of Mr. Albert E. Newton, the energetic honorary secretary. The following are the best performances recorded:—Speedwell Motor and Engineering Company's 6-h.p. Gardner-Serpollet, driven by Mr. A. J. Dew, 39 secs.; Mr. E. J. Wickens' 15-h.p. F.I.A.T., driven by owner, $49\frac{1}{5}$ secs.; Mr. E. J. Wickens' 12-h.p. "Pipe," driven by Parratt, $50\frac{4}{5}$ secs.; Speedwell Motor Company's 10-h.p. Argyll, driven by Mr. A. J. Dew, $58\frac{3}{5}$ secs.; Mr. W. L. Creyke's 8-h.p. Renault, 1 min. $7\frac{3}{5}$ secs.

Yorkshire Automobile Club.—Harewood was visited by about a dozen members last Thursday, especially for the purpose of inspecting this splendid house and grounds, which were open on that day. Fortunately this part of the country was exempt from the fearful rains which have been experienced further south, and an enjoyable afternoon therefore resulted.

Eastern Counties' Automobile Club.—The second run of the season took place last Saturday to Bury St. Edmunds and Diss, when the spirits of the members taking part were in no way damped by the fearsome weather which was experienced. The climatic conditions naturally limited the attendance, but amongst those who participated in the gathering were the following:—Mr. J. R. Egerton, 14-h.p. Princess, with C. K. Moseley, hon. secretary, and E. P. Ridley, hon. solicitor, on board; Mr. E. C. Sayer, 10-h.p. Georges Richard, with Messrs. Kettle and Edwards, Mr. Kettle driving; Mr. W. H. Bloomfield, with Mr. Fisk, 10-h.p. Boyer; Mr. and Mrs. Hackblock, Delahaye; Mr. W. T. Pretty, 28-h.p. Mercedes, with Mr. C. E. Tempest; Mr. V. T. Cooke and his brother, $4\frac{1}{2}$-h.p. De Dion. Mr. Longworth rode a Rex motor bicycle. The cars gathered at the Angel Hill, Bury, and Mr. Ridley headed the company to Diss, where a meal was served at the King's Head, the start home commencing soon after seven o'clock. Next Saturday, the 27th instant, a third run will be undertaken, the destination being announced later.

Lincolnshire Automobile Club.—Market Deeping, midway between Spalding and Peterborough, was made the venue for the Club run last Saturday afternoon. Dull and showery weather was experienced, although it might have been worse, judging by other motorists' experiences not very far away; heavy rain was falling within a few miles of the meet. The members were entertained at Fron Hall, the residence of Mr. and Mrs. George Linnell, about twenty members accepting the invitation of their host and hostess, including Mr. and Mrs. Charles Pennell, Mr. G. H. Mace, Dr. Dennison and Mr. Carter, Dr. and Mrs. Cragg, Dr. and Mrs. Husband, the Rev. and Mrs. Taylor, Mr. Carter, Dr. and Mrs. Gilpin, Mr. F. D. Tryon and Mr. Henry Tryon, and seven motor cyclists who had come over from Spalding, viz., Messrs. W. White, H. Pennington, J. Peake, W. Jepson, J. Savage, C. Gibson, and G. Hercock.

Manchester Automobile Club.—One of the most popular runs in this district is to the Brine Baths Hotel, Nantwich, from the fact that such a variety of charming roads can be selected, all of which lead to this picturesque spot. It also being, as it were, a halfway house to Chester and North Wales makes it convenient for automobilists, who are thus enabled to encounter old friends at the venue of the run. Like in other districts very great inconvenience was suffered from the weather, but although a few turned back soon after the start thirteen cars arrived carrying forty passengers, who, in spite of the rain, thoroughly enjoyed their outing. The Honorary Secretary, Mr. J. Hoyle Smith, felt lonely as the first to arrive at Nantwich, and was soon after agreeably disappointed to find that he was not to be the only one to complete the run.

WE have just received the new Ordnance Survey Map, sheet 81, for the Chatham district, which is fully equal in every respect to its predecessor, to which we have referred. The get up and scale of the map leaves nothing to be desired, and the amount of information it manages to convey, through the system of indicating heights, inclines, and even the smallest streams, paths, and rivulets, is amazing. So detailed is the map, and so clear in particulars, that it almost renders guide books superfluous. Not the least of its advantages, considering its price of 1*s*., is the fact that it is mounted on good stout linen.

VISCOUNT BOYNE has acquired a 22-b.h.p. Daimler car.

THE equipment of a new fire station just completed at Harringay includes a motor fire-engine.

THE Motor Manufacturing Company, Limited, are likely to pay a dividend of 5 per cent. to their shareholders.

DURING the King and Queen's Irish visit, two days will be spent in touring by motor car, chiefly in Co. Donegal.

THE Portsmouth and Gosport Motor Company, upon the application of Mr. A. Julian, of the South Hants Motor Company, is to be wound up.

THE Right Hon. the Earl of Stradbroke, who is so well-known throughout East Anglia, has accepted the first presidentship of the Eastern Counties Automobile Club.

"HOOPING the Hoop" and "Motoring the Hoop" madness appears to be spreading. At Earls Court Exhibition a fifteen-year old girl proposes to perpetrate this absurd feat.

"THE City and Suburban Electric Carriage Company (1903), Limited," is to be registered in place of the "City and Suburban Electric Carriage Company," which is to be wound up voluntarily.

A MOTOR omnibus service is to be run between Leeds and Stourton, a distance of about $3\frac{1}{2}$ miles, a fare of 6*d*. being charged. Last week the Leeds Watch Committee granted the necessary licence.

LORD CHARLES BERESFORD, commanding the Channel Fleet, is credited with having arranged to take his motor car to sea with him, so that he may be able to make use of it in places where the Fleet may call.

A POLICE trap has been discovered in Yorkshire on the Wetherby to York road, from the top of the hill in Acomb village to the schoolroom, a quarter of a mile. By way of keeping their hands in, the police in this district have lately taken to stopping motor cycles in addition to the cars.

THE Hydroleum Company, of Hythe Road, Willesden Junction, inform us that they have put down special plant for the repair of steam lurries of all kinds. As repairs of this class of vehicle are not always within the calibre of ordinary pleasure car practitioners, the owners of steam lurries will probably be glad to know of a point in the suburbs at which repairs can be effected.

WHAT is termed a "Theatrical Automobile Meet" is announced to take place in London on Monday next, when a number of leading actresses, it is hoped, will take part in a combined drive to a rendezvous about fifteen miles from town. Madame Jane Hading and Madame Sarah Bernhardt are amongst the attractions held forth by the organisers of this event, and it is hoped to make it an annual fixture.

THE Ariel Cycle Company, Limited, have now for some time made practical use of their motor bicycles for enabling their travellers to get about the country. Not only has this been found to be a far more speedy and economical method than using the railway, but about twice the number of customers per day can by this means be visited. In addition a very valuable advertisement is secured by giving practical evidence of the reliability and convenience of this method of locomotion.

THE drunken woman who attempted to get into the Lord Lieutenant's car in Dublin the other day, during the absence of the driver, has certainly received no more than her deserts in the term of imprisonment which was allotted to her. It is not pleasant to think of the disaster that might have been occasioned had she succeeded in starting the vehicle. It must be borne in mind, too, that any damage in such a case would have had to be paid for by the innocent and unfortunate owner, as occurred in the case of the car that was similarly started at Wandsworth.

AN enterprising police superintendent was travelling by train to Borough Bridge, one day last week, when he saw the motor car of Major Stapylton, whom he knew, being driven along a road parallel to the railway. The police superintendent looked at his watch at Ferrensby Road Bridge, near Knaresborough, got out of the train at Borough Bridge, and stopped Major Stapylton in the market place, whom he subsequently summoned for doing the 4¾ miles in fifteen minutes. Of course, Major Stapylton was convicted and fined £5—an interesting commentary on what benches of magistrates are prepared to accept as evidence in such cases.

THE *Daily Telegraph* headed its Juggernaut column one day this week by quoting the statement made by Mr. Akers-Douglas, in the House of Commons, to the effect that 191 motor car accidents had occurred in the metropolis during the present year, resulting in the death of 10 persons and injury to 204 persons. We understand that this record includes a number of cases in which motor vehicles have either been not in any way to blame or only very remotely connected with the ultimate result. The manner in which the mere presence of a motor car on the scene when a street accident takes place is construed by the daily press to constitute evidence of a motor car accident is becoming a scandal.

THE good example set by Messrs. Pratt and Co. at Lewes race meeting last week, which we recorded, has already borne fruit. It is now announced that the High Gosforth Park Company have arranged with the Northern Counties Garage, 27, Pilgrim Street, Newcastle-on-Tyne, to have in attendance during their three days' race meeting next week, a skilled mechanic, who will have charge of petrol, oil, and small accessories, and will have the necessary tools for looking after ordinary adjustments to any cars that may be required. Not only will members of the Club reap the advantage of this innovation, but non-members will also be able to benefit from the presence of a mechanic outside the gates of the Club enclosure. This action stands out in strong contrast to the refusal of permits at Newmarket and Ascot to allow cars on the Heath during the race week.

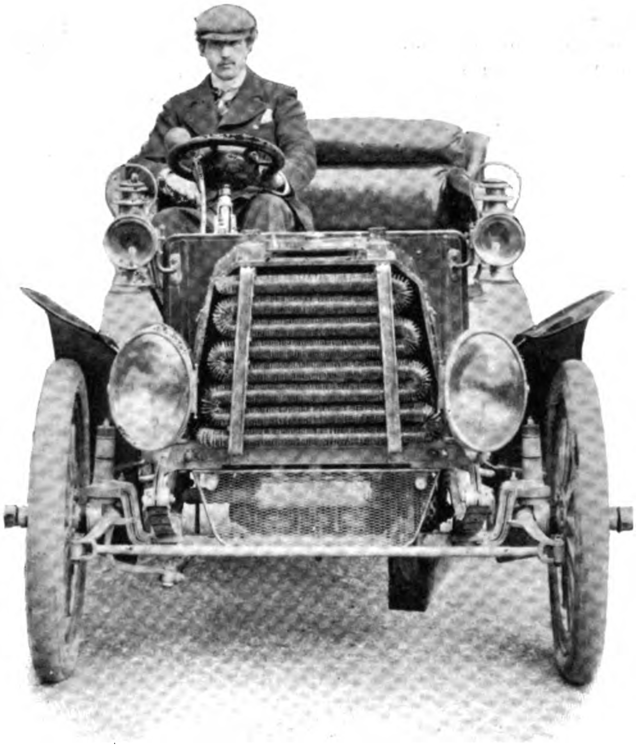
EASTBOURNE, which in the earlier days of the motor movement was a rabid anti-automobilist centre, has for some little time taken a more reasonable view of the situation. The Eastbourne Highways Committee are now enquiring into a suggested scheme for establishing a motor track in close proximity to this splendid seaside resort, and, subject to consent being accorded by the Duke of Devonshire, Mr. Davies-Gilbert, and Mr. Freeman Thomas, M.P., through whose estates the road would run, it is hoped practical effect may be given to what should prove a splendid attraction to Eastbourne. The benefits which, save for the action of one man, might have been secured by Bexhill-on-Sea will probably therefore be transferred to this town.

FATE appears to be against the meetings of the Automobile Club. Almost without exception all the important events, if of long duration, have been started in exceptionally bad weather, or, if merely day events, have been greatly marred by phenomenal downpours. Last year, on the date appointed for the Ranelagh Motor Gymkhana, the grounds were practically one huge swamp. Those who were in London last Saturday—the date of this year's Gymkhana—hardly need reminding of the impossibility of carrying out the programme owing to the tropical rain which descended during the whole of the afternoon. The disappointment caused by the necessity of again postponing this meeting was the more keenly felt from the fact that the King and Queen had both signified their intention of being present.

THE Continental Caoutchouc and Gutta Percha Company, of Holborn Viaduct, have published a description of their Continental motor tyre puttees. These puttees are said to be greatly preferable, for temporary repairs of pneumatic tyres, to the leather sleeves which have been in general use. The puttee consists of a stout rubber band provided with straps at either end for attachment to the spokes. The inner tube is repaired in the ordinary way, and a cover plaster, provided with a coating of rubber solution, is put on outside the outer cover, care being taken that its edges come inside the rim of the wheel. One end of the rubber band is then strapped to one of the spokes, wound round both tyre and rim outside the plaster, and secured by strapping the other end to a second spoke.

OUR electrical contemporaries have been making a good deal of fun of the scientific ignorance frequently displayed by writers in the daily papers. As a gem illustrating the want of knowledge with which articles on scientific subjects are frequently penned, we give intact the following item from "Science Notes" in the *Daily News* :—

> **Ohms, Volts, Amperes, and Watts.**
>
> But this was simplicity itself compared with the complex machinery necessary for applying the "high frequency" treatment. To understand this I had to learn the elementary terms used by electricians in talking of the mysterious "current" with which they deal. The "volts" of a current are the degrees of energy with which it seeks to pass along any wire, big or small—what without any strained analogy we may call the "pressure" at which it is supplied. The "ohm" is the unit of resistance to the flow in the particular wire or conducting medium employed, and this is measured by the point of greatest resistance in a circuit, just as the capacity of a pipe must be measured by its smallest point. Dividing the "ohms" of a given circuit into the "voltage" or pressure of a given supply, we get the number of ampères, or the size of the stream or current that will flow in the circumstances. Lastly, multiplying the ampères, or current measurement, by the time during which the current flows, we get the number of "watts," or the quantity of energy or current which has been consumed.



The above illustration represents one of the latest Brooke cars, which has been driven by Mr. Frank Wellington a distance of over 3,000 miles, without, we understand, any trouble whatever. The vehicle differs from previous Brooke vehicles in having an ordinary radiator instead of the special Estcourt coolers, which have hitherto been a distinctive feature so far as external appearance is concerned. A circulating pump is used in connection with the radiator, instead of the thermo-syphon system hitherto adopted.

LAST week the reception which took place at Lillie Hall, Earl's Court—the automobile motor works and garage of Messrs. C. S. Rolls and Co.—was very largely patronised, particularly by Society, quite a fashionable throng assembling for what was to them a new experience. Considerable taste was displayed in the decorations of the premises and the approaches, plants and bunting being freely employed. The premises, which have been specially organised for repairs of motor cars however serious, cover an area of about 30,000 square feet. Upon the occasion of the reception some interesting contrasts were arranged by placing side by side with the original Panhard, of 1894, the latest form of modern automobile racer on which Mr. Rolls made a record time for the flying kilometre at Welbeck, the speed attained being nearly 83 miles per hour. In addition there was Mr. Rolls's Paris-Vienna racer, and the main building was well filled with practically every variety of motor vehicle to suit the requirements of different clients, whether commercial men, ladies, medical practitioners, or others. At present about sixty workmen are employed by the Company, and by the introduction of electrically-driven American machine tools all parts for a car, if necessary, could be actually turned out on the premises. A series of cinematograph pictures taken during the Paris-Madrid race created a considerable amount of interest amongst the visitors, for whom a Viennese band and other amusements were provided during the time occupied in sipping afternoon tea.

THE second Automobile Congress was formally opened in Paris on Monday last by the President, the Baron de Zuylen.

A BRANCH of the Cannstatt Daimler Motor Company has been formed in Milan for the purpose of manufacturing cars in Italy.

THE French Minister of Commerce has accepted the patronage of the A.C. de France Automobile Salon for 1903, which will be held in December next, about the same dates as last year.

AFTER viewing the magnificent premises of the Automobile Club of France in the Place de la Concorde, it is difficult to imagine that extra premises could possibly be required. It is, however, announced that the Club have now acquired adjoining premises at No. 8, which will be adapted to the requirements of the members.

SPA, in Belgium, looks like getting a good motodrome, as last week the town authorities granted free a splendid site in the middle of Fagnes, between Malchamps and Bronromme. Ten kilometres in length will be available, but the exact shape which the motodrome is to take remains to be settled later. One important item, however, must not be forgotten, viz., the necessary capital for carrying out the scheme.

AN automobile has been regularly run in Paris each season by the "Tourist Office" from the *New York Herald* Office to various interesting points round Paris, such as Fontainebleau, etc., each day a different route and destination being selected. For the service this year a 6-seated 12-h.p De Dietrich car has been put on the road. An average of about 24 miles an hour can be maintained, and the occupants of the car are thoroughly protected against inclement weather.

THE interest of the recent race meeting at Longchamps was very greatly increased by the visit paid to it by M. Santos-Dumont. It is the first time on record, we believe, that a race meeting has been visited by an airship, which, after manœuvring above the course, finally descended among the spectators with perfect precision, witnessed the race, and departed again. This was, however, what M. Santos-Dumont, with his large No. 9 machine, which has just been finished, accomplished on Sunday last. He left his shed at Neuilly, ran in a straight line down to Longchamps, where, on arriving above the course, he was loudly cheered. He then executed a number of figures of eight and other evolutions above the course, reversing and turning right and left, and finally descended to the ground, where he received a perfect ovation from the spectators. After witnessing one of the races he mounted into the air again and returned to Neuilly. An amusing feature of the episode was that the superstitions of a number of the betting men present for once led them to good fortune. Seeing the number 9 on M. Dumont's balloon, a number of them immediately backed the ninth horse on the card for the next race, the Prix de Seine et Marne. The excitement was considerable when this horse came in a winner. More remarkable still was the fact that exactly the same thing occurred in the following race for the Prix de Longchamps.

PROFESSOR PICKERING, the well-known astronomer of Hartford University, has been for a considerable time past a votary of aeronautics, and he is now constructing a new air-ship. He has spent some six months on this side of the Atlantic investigating the abilities of the various motor makers to provide the lightest and most suitable engine for the purpose he has in hand. The result of his investigations has not proved very flattering to European manufacturers, unless it be that Professor Pickering's patriotism has triumphed over his judgment, for he has finally given an order for a 30-h.p. 6-cylinder engine to the Duryea Power Company, Reading, Pa. This machine will weigh, without fuel or tanks, 200 lbs., and will, we understand, be the lightest engine for its power that has hitherto been built. It is anticipated that Professor Pickering's air-ship will be ready to make its first flight early in the autumn.

A FEW weeks ago we drew attention to the skits which were appearing in America illustrating the effect which might be supposed to follow upon the various numbering laws being brought into force throughout the United States, each state having the power to make its own speed laws and enforce separate registration, and the carrying of separate numbers for each particular state. Although matters may not be quite as bad as the pictures presented in the caricatures, it would appear that some method will have to be adopted by tourists which will come very near the humorous artist's suggestions. Already a practical device to meet this requirement has been put forward in which the numbers can be reversed for automobilists living on either side of the Hudson River, and this will probably be followed by a rotary number plate being invented on the plan of rotary calendars, whereby upon crossing the boundary of any state, the driver can at once readjust his number to suit the state in which he is travelling. The prospect, however, of a mistake being made in the adjustment of the number is hardly pleasant to the wretched automobolist whose number happens to have been shown in error. In England we have something to be thankful for that the absurdity of such a position has long since been realised by our authorities, and whatever laws may be provided will be applicable to the whole country.

FOR a year or more an American millionaires' speedway has been spoken of as likely to be constructed in the United States, but this apparently is still in the clouds. Another scheme is now put forward, founded upon commercial principles which, if carried out, may prove an enormous incentive in other districts to construct a similar roadway. General Roy Stone (whose daughter, Mrs. Lawrence Turnure, will shortly marry Lord Monson), is responsible for the project, and he proposes that a 40-ft. automobile speedway, 113 miles long, running through the centre of Long Island, connecting Montauk Point up with New York, should be constructed. It would be a double-track steel road, and its use would be confined exclusively to pleasure and commercial motor vehicles, a revenue being obtained to pay for its construction and maintenance by means of tolls. The scheme is now being considered by the N.A.A.M., the A.L.A.M., and the American Automobile Association, and if approved it is proposed that they should finance the undertaking, the estimated cost of which is about £3,000 per mile, including the acquisition of the right of way and the fencing in on both sides. The two tracks, which are to be 5 ft. between centres, are to be laid on the grass, the public highways being carried over the speedway by bridging. Amongst other advantages in addition to economy which this road, it is claimed, will possess is that there would be no dust nor mud nor the glare usually experienced from the roadway.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories either as their principal or part of their objects.

Artillery Wheel Works (Limited), 19 and 20, Holborn Viaduct, E.C.—Capital, £3,000 in £1 shares (1,000 seven-and-a-half per cent. cumulative preference). Object, to carry on the business of wheelwrights, dealers in and letters to hire of carriages, and motors or horseless carriages, and vehicles of every kind. First directors, H. Nowell and H. S. W. Pennington.

Edinburgh Garage and Motor Company (Limited).—Capital, £5,000 in £1 shares. (Scotch Company.)

The Continental Automobile Company (Limited).—Capital, £60,000 (20,000 preference) in £1 shares. (Registered in Guernsey.)

F.I.A.T. Motor Agency (Limited).—Capital, £40,000 in £1 shares. (Registered in Guernsey.)

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published June 18th, 1903.

7,104.	W. and K. A. ROWBOTHAM. Gas and oil engines.
12,971.	M. A. EUDELIN. Driving, steering, and controlling devices.
13,001.	J. A. DE MACEDO. Weather screens
15,779.	H. HEATLY and W. HUNT. Multiple speed gearing and clutch and brake mechanism.
15,477.	W. A. TAYLOR. Driving gear of motor cycles.
15,478.	HOZIER ENGINEERING COMPANY. Under frames.
16,017.	S. DIAMANT and C. COZZI. Speed gear.
16,163.	H. LUCAS and J. PERRY. Lamps.
16,189.	A F. EVANS. Ignition apparatus.
17,496.	W. E. WRIGHT. Dust shield.

Published June 25th, 1903.

12,568.	V. C. DOUBLEDAY. Steam generators.
12 704.	L. RENAULT. Brakes and clutches.
12,872.	T. J. SIMMONS. Old engine.
14,233.	W. A. TAYLOR. Motor cycles.
14,234.	W. A. TAYLOR. Motor cars.
15,028.	J. A. WEYLAND. Internal combustion engines.
15,613.	R BOMFORD and others. Motor-driven vehicles.
15,747.	M. SUTHERLAND and E. MARCUSON. Storage batteries.
16,411.	H. CARMONT. Resilient tyres.
16,413.	C. M. SHAW. Steam condensers.
16,427.	E. L. COOPER. Transmitting gear.
16,698.	D. SAMPSON, Admin. late J. H. SAMPTON. Flying machine.

Applied for in 1903.

Published June 18th, 1903.

1,493.	A. FERRARIS and E. SEHRINGER. Motor bicycle with free motor and speed-changing gear.
3,415.	L. W. CROSTA and others. Silencer.
4,665.	A. WINTON. Exhaust mufflers.
4,804.	C. W. STANTON. Means for the disposal of smoke and products of combustion.
8,736.	E. E. ARNOLD. Valve.

Published June 25th, 1903.

247.	A. JANSSENS. Device for steering.
511.	F. DUCENNE. Brakes for cycles and motor-cycles.
5,893.	A. VOGEL and R. EGG. Electric sparking plugs,
6,147.	C. H. WHATLEY and L. BENCK. Face Shield.
7,591.	J. W. and H. W. PARKIN. Change and reversing gears.
7,681.	A. B. RECK. Apparatus for producing circulation of water in water-jacketed apparatus.
8,558.	T. HOUBEN. Cover for pneumatic tyres.
8,778.	KRIEGER AND CO., PARISIENNE DES VOITURES ELECTRIQUES. Electrically-propelled road vehicle.
8,964.	S. YAI. Electric batteries.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies and the Continent.

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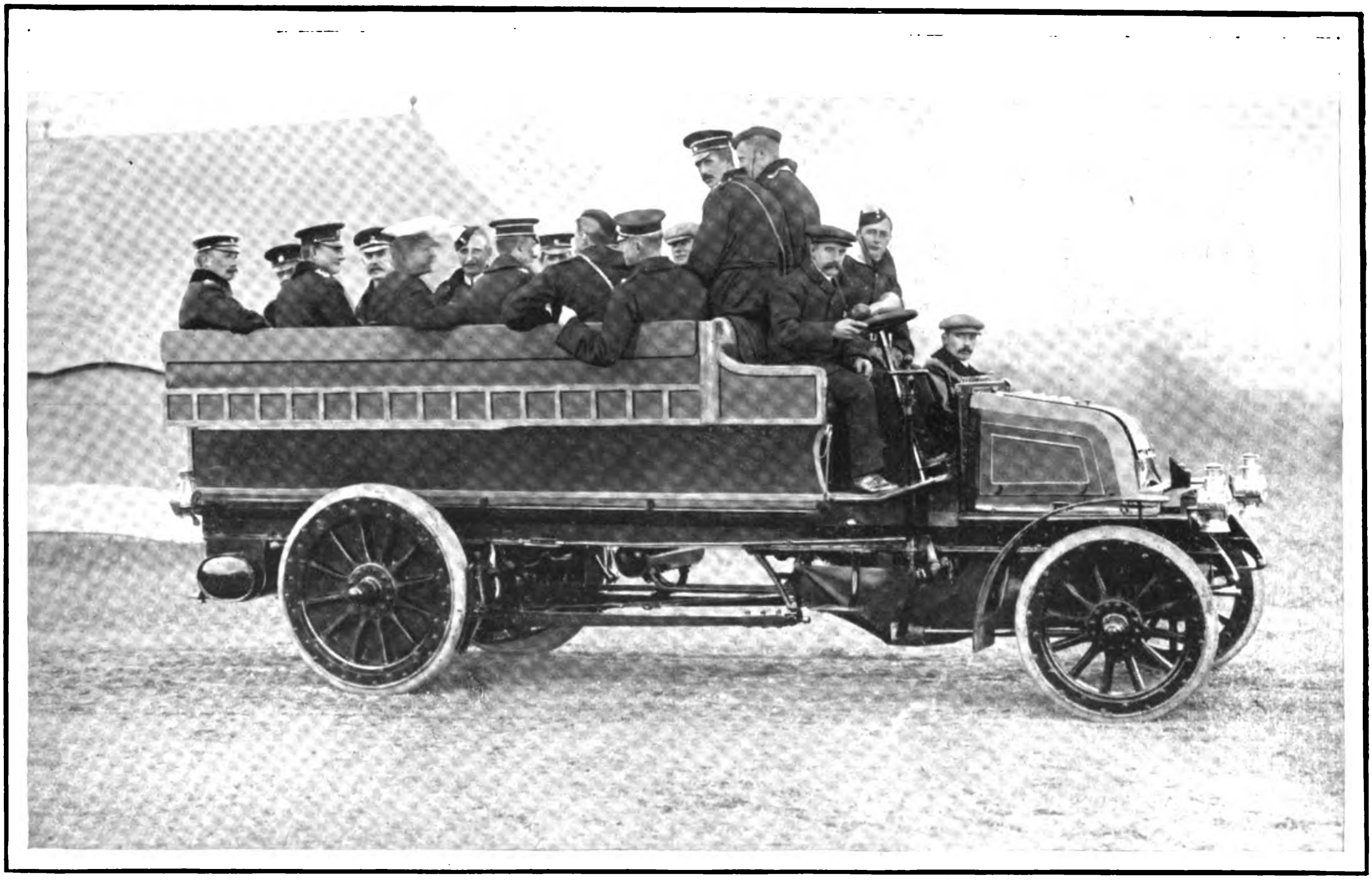

Officers of the Yorks Dragoon Imperial Yeomanry in the Duke of Portland's Motor Wagonette. The Earl of Scarbrough occupied the seat at the extreme end of the car.

THE AUTOMOTOR JOURNAL.

Telephone No.—
1828 Gerrard.

Telegraphic Address—
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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

DIARY OF FORTHCOMING EVENTS.

British Events.

1903.		
July 1 ...	* The Irish Fortnight.	Exhibition at Dublin of Gordon-Bennett Cup Cars.
July 2 ...		Gordon-Bennett Race.
July 4 ...		Speed Trials, Phœnix Park; Motor Cycle Time Trials; Viceregal Garden Party.
July 6 ..		Tour to Newcastle and Belfast.
July 7 ...		Four-mile Time Test and Hill Climbing Trial for the Henry Edmunds Trophy; 4 Mile Motor Cycle Race (Newcastle, co. Down).
July 8 ...		Return to Dublin.
July 9 ...		Start for Cork.
July 10 ...		Arrival at Cork.
		Eliminating Race for Motor Boats, and Speed or Hill Climbing Trial.
July 11 ...		Motor Boat Race (Alfred Harmsworth Cup) at Queenstown.
July 13 ...		Start of Tour through the South.
July 14 ...		Arrival at Killarney.
July 15 ...		Hill Climbing Trial on the Killorglin-Tralee road for the County of Kerry Cup.
*July 24 ...	...	100 Miles Quarterly Trial.
July 24-25	...	Southport Speed Trials.
July 25 ...	...	Midland Auto Club Hill Climb.
*August 10-22	...	Tourist Motor Bicycle Reliability Trial.
*August 22	...	Annual Open Race for Motor Bicycles.
*September	...	The 1,000 Miles Trial.
September 12	...	Hill Climb (Midland Auto Club).
October 10	...	Hill Climb (Midland Auto Club).
*November	...	Side-Slip Trials.
1904.		
	...	*Light Van Trials.
*Feb. 12-24	...	2nd Annual Exhibition of the Society of Motor Manufacturers and Traders at the Crystal Palace.
May. ...	...	Electrical Vehicle Trials (6 days).

* Automobile Club of Great Britain and Ireland Events.

Foreign Events (Trials, Races, &c.).

(All French road racing fixtures are subject to confirmation by the French authorities.)

1903.		
July 11-18	...	Ostende Automobile Week.
July 15 ...	...	Competition of Fuels for Motors (A.C. de France).
July 19 ...	...	Circuit de L'Argonne (Ardennes Francaise). 400 kiloms. (Chambre Syndicale de l'Automobile). Entries close July 11. Double fees from June 16.
August 30	...	Criterium du Quart de Litre (*L'Auto*) 100 kiloms. Parc des Princes.
Sep. 6-13	...	Vienna Week, including the Austrian "Circuit" (Sep. 6); Coupe Pœtting (Sep. 7); and Semmering Hill Climb (Sep. 13).
September	...	Udine Exhibition (Italy).
Oct. 5. ...	...	Paris Cab and Delivery Van Trials (A.C. de France).
Oct. 15-21	...	Leipzig Exhibition.
Nov. 15 ...	...	German War Office Alcohol Heavy Vehicle Trials. Entries close Nov. 1.
December	...	Paris Salon (A.C. de France).

CONTRIBUTIONS AND ARTICLES.

Contributions and articles likely to prove of interest to our readers will receive due attention, but in all cases the name and address of the writer must be given, not necessarily for publication.

All matter intended for publication should be addressed to The Editor of "The Automotor Journal," 44, *St. Martin's Lane, London, W.C. Stamped envelope must be sent if the manuscript is required to be returned.*

For purchase of electros and illustrations from this journal, please apply to our representatives, Messrs. Bolak's Electrotype Agency, 10, *Bolt Court, E.C.*

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PASSING EVENTS.

GORDON-BENNETT RACE.

By this time next week, unless something totally unforeseen occurs, the first great motor car race ever held in these islands will be already a matter of history. Nothing serious seems likely to result from the rumours of the threatened Treasury action in regard to the police, to which we referred in our last issue. In no case could it have the effect of stopping the race. The worst that could happen would be that subsequent litigation might result, and from the appearance of things at present that is highly improbable. At any rate, it would be quite impossible for the Treasury to maintain a claim that the keeping and feeding of the police during the time they are wanted at the course could by any possibility be chargeable either to the County Councils that have given permission for the race to be held or for the promoters of the contest. The most that could be asked for would be that the expenses of conveying the police to the course should be defrayed, and that demand, if pressed, could probably be met—in fact the Club is already sending the hat round on behalf of the Government.

The final fixture and satisfactory conduct, both of the preliminary arrangements, which have cost the Club and the Club Secretary such an enormous amount of time and trouble, the successful piloting through Parliament by Mr. Scott-Montagu of the enabling Act, and the effect upon the British automobile industry which the holding of the race in this country will undoubtedly exercise, are matters for the sincerest congratulation to all concerned. Nor must we leave out of consideration the benefit that will accrue both immediately and in the future to the one part of the British Empire which, perhaps, more than any other, stands in need of the benefits which the influx of increased tourist traffic is likely to bring with it. All concerned in the undertaking have the best of rights to congratulate themselves, and we are particularly satisfied to be able to recall that from the moment the holding of the race in the British Islands was rendered possible by Mr. Edge's victory last year, we have consistently and persistently, in season and out of season, advocated the course of action which has been adopted, and which has led to the holding of the race in the United Kingdom.

It is to be hoped, and, in fact, anticipated with much confidence, that no casualties will take place on the day of the race. As shown by the successful manner in which the Circuit des Ardennes has been this week carried out, motor racing may be as safe as any other form of sport existing, and the conditions under which the Irish race will be held are even better calculated to prevent the occurrence of accidents than those prevailing in the Belgian event. All possible precautions, as we have previously pointed out, have been taken. Both official and unofficial precautions and injunctions of every kind are being issued. The Bishop of Kildare sympathetically warns all his diocesans against the great temptation which will be experienced towards over-indulgence in inebriating beverages, and issues a pastoral caution against giving way to it. The caution is likely to be the more effective from the sympathetic tone which the right reverend gentleman adopts. He evidently has personal experience in withstanding the temptation to which he refers. It is to be hoped that his advice will be universally taken, as it will certainly facilitate the keeping of the course by the stewards and police concerned. Another somewhat humorous pronouncement has been put forth in the columns of the Irish Press by the Canine Defence League, which gives notice that "on account of the reckless killing of dogs on the highways by motorists, dog owners are earnestly entreated to keep their dogs shut in during the hours for the Gordon-Bennett Cup." This is as it should be. At the same time, we think, with due deference, it might have been put the other way round—viz., "owing to the danger to the competitors in the race likely to be occasioned by the ill-advised evolutions of dogs upon the course, &c." Perhaps, also, the Canine Defence League would do good service if it issued a *pronunciamento* dissuading persons who may be possessed of dogs, with whose services they desire to dispense, of making use of the race as an inexpensive method of effecting their extinction.

THE 1,000 MILES RELIABILITY TRIAL RULES.

THE Trials Organisation Committee of the Automobile Club have issued a most complete system of rules for the conduct of the 1,000 Miles Reliability Trials, which are to take place in September next, and we publish a *resumé* of them, embodying all the important provisions, in another column. As in the 650 Miles Trials, held last year, the cars will start every day from the Crystal Palace and will return there every night, and an even greater degree of strictness will be maintained throughout the tests than prevailed last year. Thus, at the end of each day's run, the vehicles will be immediately driven into the storage building, from which the public, drivers, mechanics, and everyone except the Club Officials will be rigidly excluded. The Official Observer is to be the last person to leave the car, and he is to see that the driver does nothing further than turn off the fuel, lubricating oil, water, and electric current connections. For anything done to the car beyond this, marks are to be deducted, as also for filling up tanks at any time. After the Observer has taken possession of the car in the morning, the word to start will be given, and any adjustments or repairs made after that will cause a loss of marks.

It is interesting to consider the effect of the new rules from the point of view of the prospective purchaser of a car—the person for whom the results are primarily intended as guidance. There are seventeen headings under which marks will be awarded, the most important of which are general reliability, cleaning and replenishing, hill-climbing, and condition after trial; speed on the track, fuel consumption, and dustlessness coming next. The vehicles are again divided into classes according to their advertised price, and separate awards are given to each class. The order of the cars in those classes will be determined by the total number of marks awarded them under all headings.

The system of marking employed demands attention. The best car in each category, irrespective of class, that is to say, the one that loses fewest marks under any particular heading, will be finally given the maximum marks allotted to that heading, the marks of the others being proportionately varied. When the marks in all the different categories are set out separately, any intending purchaser, by inspecting the marks published, will be able to estimate the suitability of any particular car to his special requirements. This, however, he will only be able to do approximately as far as hill-climbing and speed on the track are concerned, for, in the formulæ deciding both of these, the price of the car is introduced as a factor. We have repeatedly stated in the past, and still think it a great mistake that this should be done. It is, of course, the intention of the Committee to show the hill-climbing power and speed of different makes of cars relatively to the prices charged for them. But what is really needed is that the hill-climbing power should be shown *absolutely*; this is all the more true because it does not by any means follow that the price of a car, at the time some particular purchaser wishes to purchase it, is the same as it was at the time of the trial. Hill-climbing is a very important matter, and it would be much better if the trial provided absolute information as to which car, irrespective of price, is the best hill climber, and allow the intending purchaser to look after his own pocket. As at present arranged, the marks given under this heading will fail to afford that amount of detailed information which they otherwise would.

The price factor also, of course, affects the total marks, not only by vitiating the hill-climbing and speed results, but also by the introduction of what may be called a compensation allowance for cheapness, by the award of 7 marks for every £1 per cent. that the price of a car is below the maximum price of the class to which it belongs. This is not only complicated in its effect, but renders it very difficult to grasp what the totals really signify.

We are glad, however, to be able to record that, as compared with last year, the recommendations which we then put forward have been followed in some very essential particulars. These are the separation of hill-climbing from fuel consumption, and the allotment of marks for absence of noise A further improvement in the conditions under which the trial will be held is that the fuel consumption will be measured every day and all day, that the hill-climbing tests will be introduced on several different days as part of the ordinary run, and will be taken with flying starts.

The rules which will govern the Trials for Motor Cycles in August have been issued by the Auto-Cycle Club. These rules, also, have been elaborated very carefully by the Committee dealing with them, and a *resumé* of them will be given by us next week. It is the first time that any Reliability Trials of Motor Cycles have been organised in this country, and the subject presents considerable difficulties. These have been most successfully dealt with by the Committee, and, as far as can be judged at present, those proposed ought to work satisfactorily. A new feature in the trial will be the employment of stationary observers every 10 miles. The maximum of 100 marks, however, would appear to suffer from inadequacy, as in deducting marks it will be almost certainly necessary to resort to the deduction of fractions of marks, and it would appear preferable to adopt as a maximum a much larger number, say 1,000.

The preparation both of the rules for the car trials and those for the cycle trials must have entailed an enormous expenditure of time and trouble, and the automobile industry in this country should be very thankful to those who have devoted so much energy and consideration to the framing of the very complete systems of regulations to which we have referred.

NOT COMMON HUMANITY.

THE decisions of magistrates in motor car cases, as we have unfortunately often had occasion to point out, are frequently prejudiced. Seldom do they look at the common-sense aspects of the case. Still, they are administering the law as it stands, and if they do not administer it with discretion, they are merely open to the ordinary and legitimate criticism to which indiscriminate enforcement of an inadequate statute naturally lays them open. The magistrates of the bench of Melbourne, in Derbyshire, however, have recently convicted an automobilist under circumstances which call for something more than mere criticism or protest. Their decision is simply lacking not only in common sense but in the commonest elements of humanity. The Rev. Mr. T. Orrell, of Foremark, was suddenly taken very seriously and dangerously ill. Mr. Frank Lawson, of Foremark Hall, a well-known member of the Derby Automobile Club, undertook to go to Melbourne to fetch Dr. Tredinnick to the clergyman's assistance, and as the case was exceedingly pressing Mr. Lawson instructed his driver to proceed at top speed. Of course, the police were unaware of the circumstances of the case, and, not unjustifiably therefore under the circumstances, took out a summons against Mr. Lawson, but when the case came before the Melbourne Bench the circumstances were fully explained. The chairman of the Bench, impelled by that mysterious influence which seems to prompt magistrates to accompany their most irrational decisions by gratuitously fatuous remarks, maintained that in fetching the doctor to cure the patient, who was known to be in danger, somebody in the road—to wit, children playing on it—might have been injured or killed, and so Mr. Lawson was fined £1 and costs, coming to £2 2s. in all. Among all the egregious decisions on which we have from time to time had to comment we have not encountered such an example as this. The only way in which the Melbourne magistrates would make their position logical is by issuing instructions that the drivers of all fire engines proceeding to a fire should be proceeded against for furious driving. They, like the doctor, are bound on a mission of life and death, and everyone has tacitly agreed that under such circumstances danger and possible accidents must be risked.

AND VINDICTIVENESS ELSEWHERE.

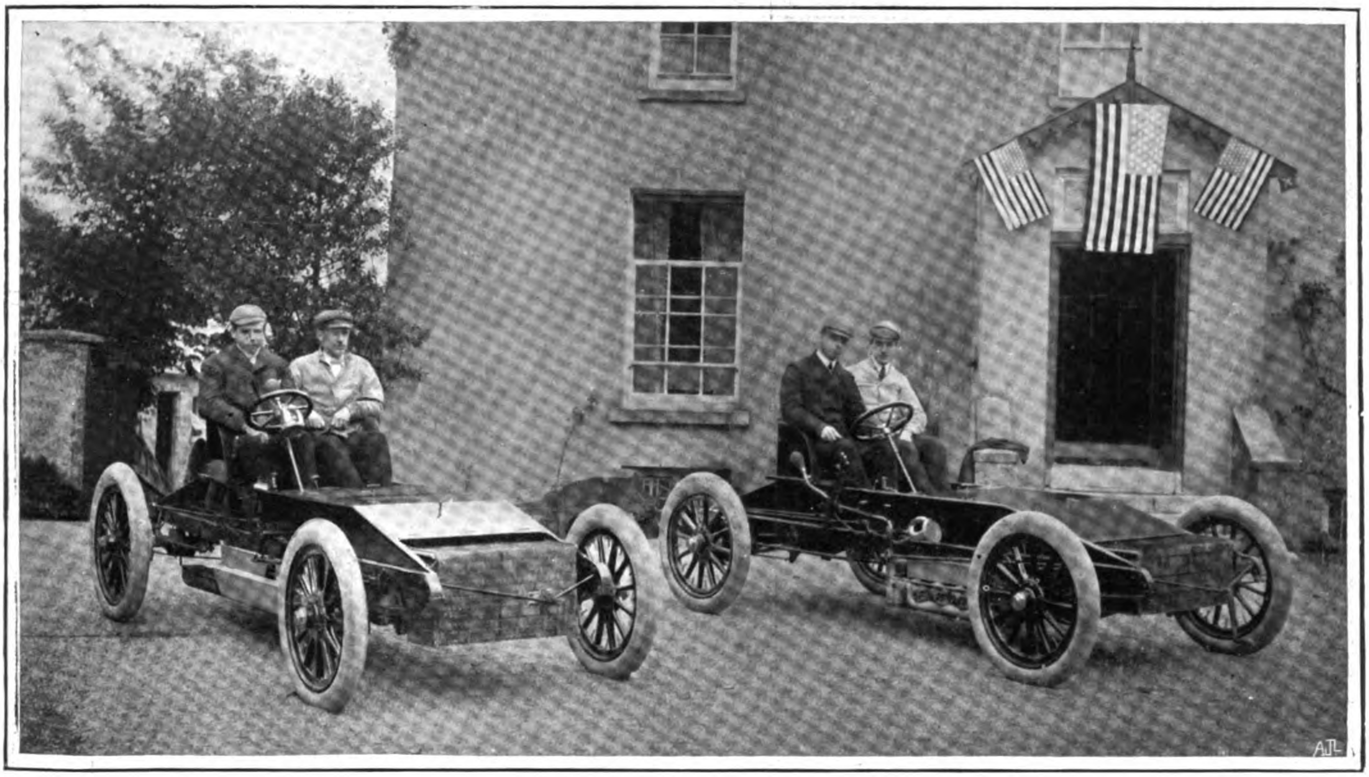
IN the south of the country—in historic Surrey—the Guildford magistrates were at about the same time occupied in maintaining their not particularly enviable reputation. A batch of automobilists had fallen into one of the usual police traps which are regularly organised on the Ripley road. Most of the drivers haled before the Bench were fined £3. One driver, however, being a public-spirited individual, on springing the trap, had gone back and warned a number of other automobilists, and on him the Guildford magistrates inflicted the maximum penalty of £10, though it was not alleged that he was travelling at any very excessive speed. The infliction of the maximum fine in this case, which the magistrates were empowered to impose, cannot be looked upon as anything but an exhibition of puerile vindictiveness. What had the unfortunate victim done? Merely warned other automobilists not to break the law, and to do this cannot be an offence in any way in itself. We have frequently insisted that the object of these prosecutions and the organisation of police traps is designed, not so much to prevent breaches of the law as to relieve local rates by the collection of fines. The irritation displayed by the Guildford magistrates certainly seems to support this view. This is one of those cases in which an appeal to Quarter Sessions to have the fine reduced (which can be made in all cases where a fine of £5 or upwards is inflicted) might be worth lodging. In some parts of Surrey magistrates are displaying a more reasonable spirit, four cases having recently been dismissed at Dorking on the ground that the Bench was not satisfied that the accused were exceeding the legal limit by any appreciable amount.

WELL MEANT.

SOME of our friends and sympathisers would appear to consider that—probably as the result of anti-motorial correspondence in the daily Press—we are in danger of being subjected to personal violence. One of them, at any rate, has sent us an ingenious form of collapsible life preserver—"the Hooligan's terror"—which, when fully expanded, somewhat resembles a policeman's *batôn*, but which can be shut up and carried in the pocket. We believe our sympathiser also designs the instrument for the protection of automobilists on the road. It is Sir Ralph Payne-Gallwey and his sympathisers, however, which they have most, we fancy, to consider, and against their tactics, we fear, the life preserver, though generally handy and serviceable, would not be of much avail.

THE GORDON-BENNETT RACE AND THE IRISH FORTNIGHT.

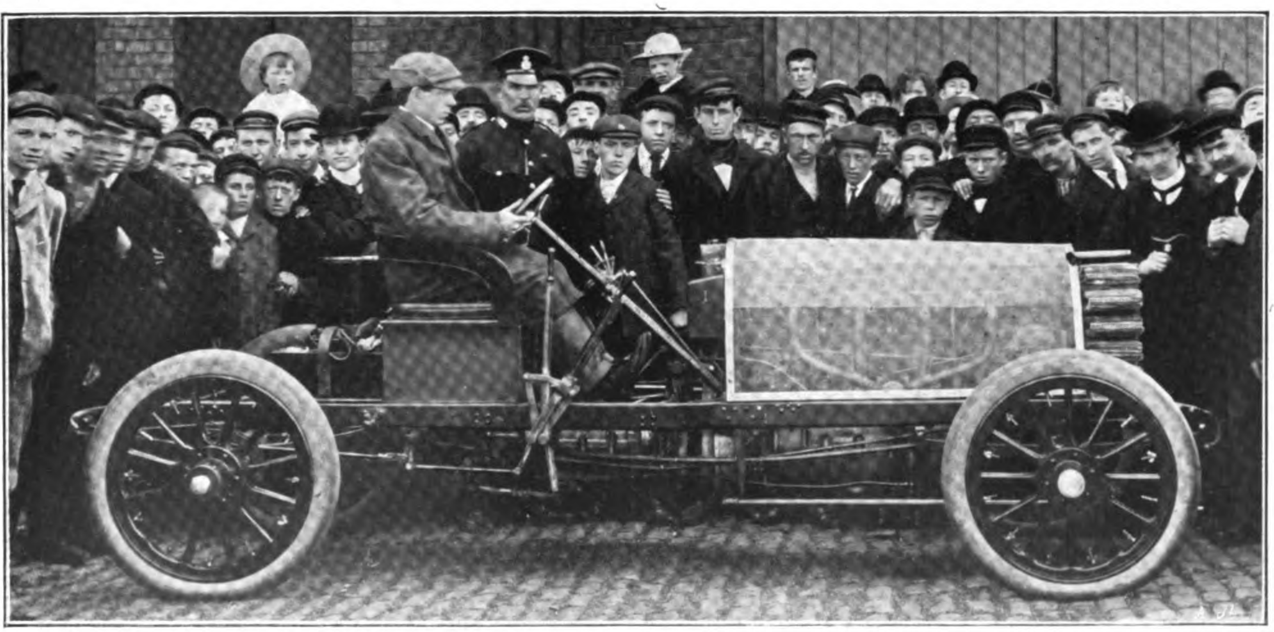
THE AMERICAN TEAM AND THEIR CARS.



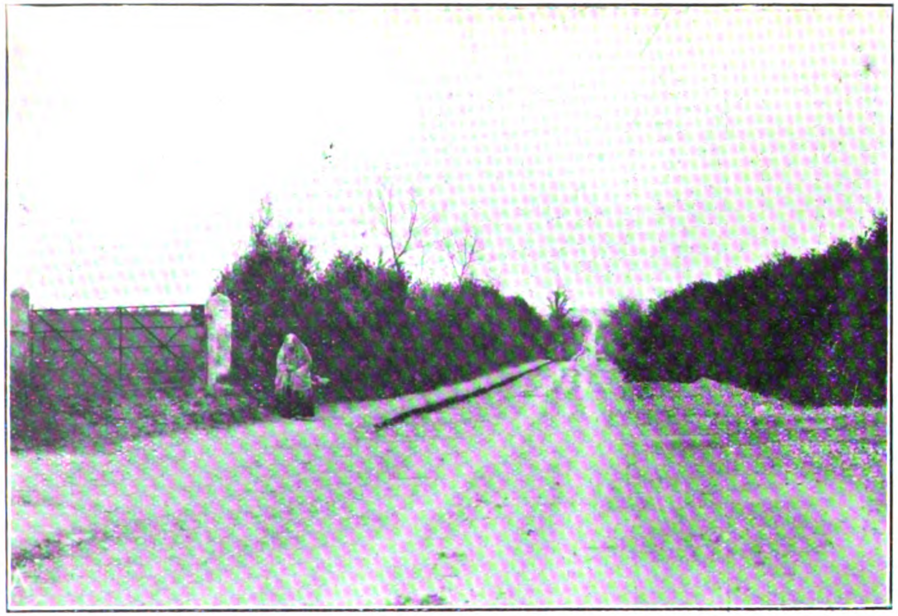
Mr. Alexander Winton, with his mechanician, on his 8-cylinder car.

Mr. Percy Owen and his mechanician on the smaller Winton car.

Gordon-Bennett Cup Race.—At Timolin Rectory, the Headquarters of the American Team.



Gordon-Bennett Cup Race.—L. P. Mooers on his 80-h.p. Peerless Car, taken immediately after his arrival at Dublin.



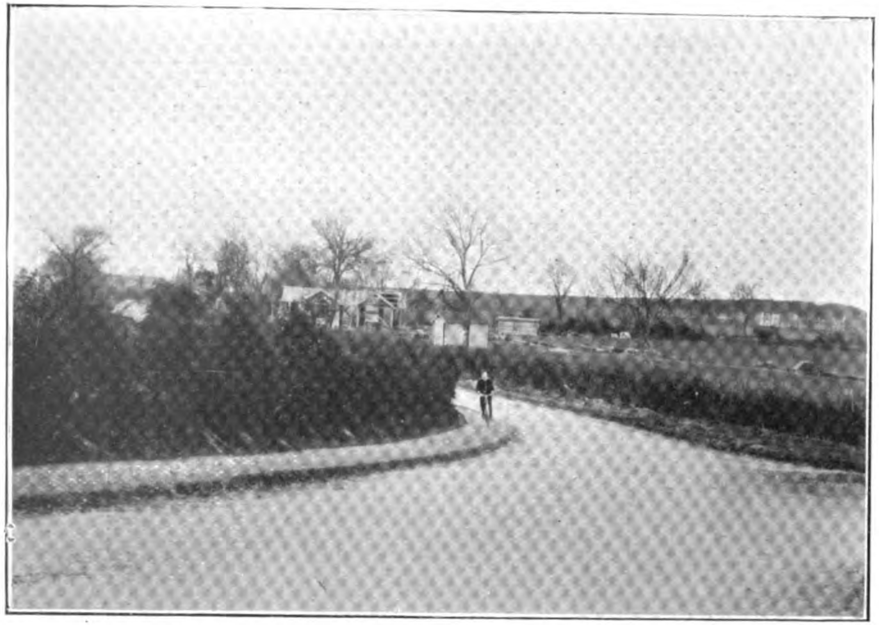
The straight road from Athy to the Moat of Ardscull.

The road running round the Ardscull Moat, as seen from between the trees.

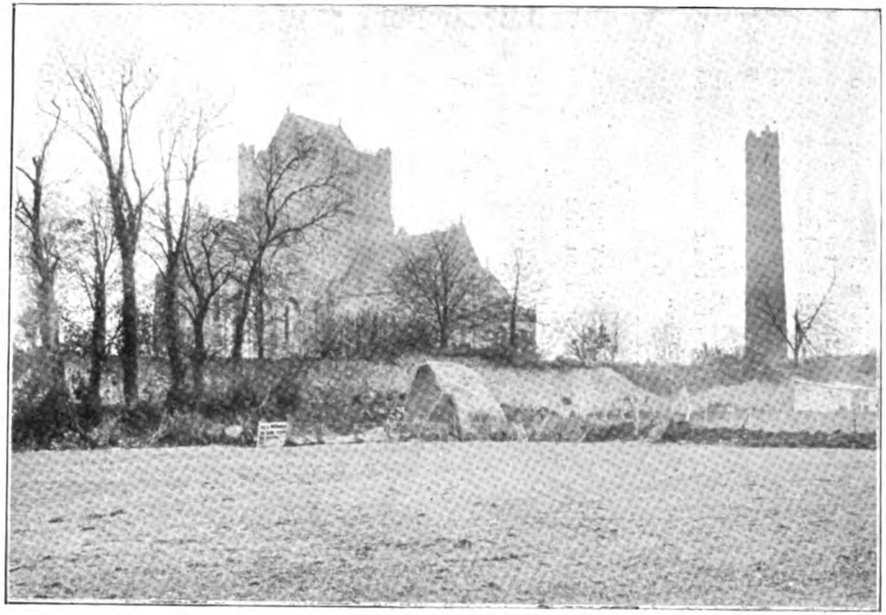
Kilcullen.—The first sharp turn on the Western Circuit.

An estate gate at Castlemartyn, beyond Kilcullen.

GORDON-BENNETT RACE.—SCENES ON THE COURSE.

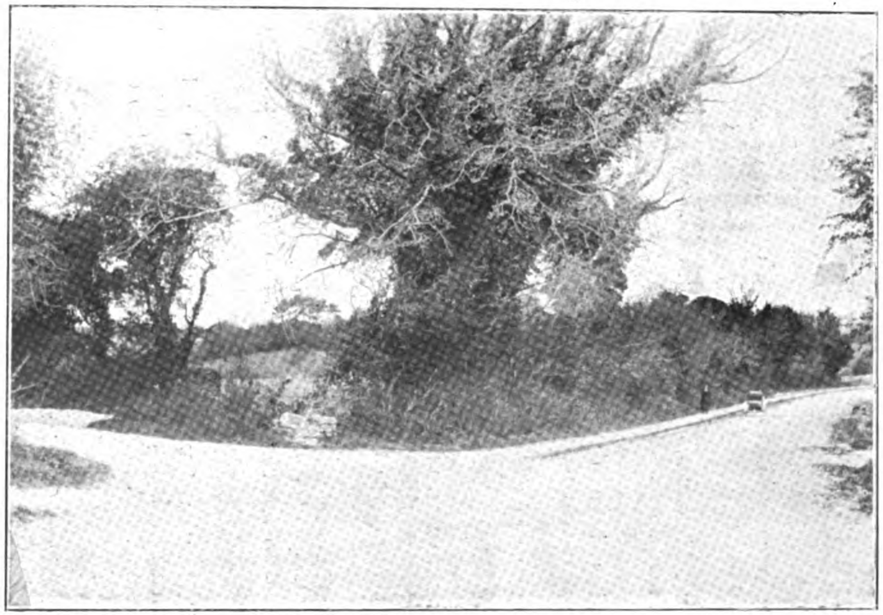


The entrance into Kildare



St. Bridgide Cathedral, Kildare.

Monasterevan, as seen from the bridge over the Barrow.



"Simmons Corner."

GORDON-BENNETT RACE.—SCENES ON THE COURSE.

THE GORDON-BENNETT CUP AND IRISH FORTNIGHT.

The race will take place whatever the weather conditions.

Lieut. Mansfield Smith-Cumming has agreed to drive one of the pilot cars.

It has been determined to abandon the gymkhana arranged to take place in Dublin on July 3rd.

Members of the A.C.G.B.I. have been made honorary members of the Union Club, Belfast, for the Fortnight.

A rehearsal of the race will take place at 3 a.m., starting from Kildare on July 1st. Six cars will traverse the circle to the east and six to the west.

The Cup cars will be weighed at Naas Market Square, co. Kildare, at 11 a.m. on July 1st. They will then be examined to see that they conform to the rules, and then marked.

H.R.H. the Duke of Connaught and the Lord-Lieutenant of Ireland have reserved seats on the Club grand stand. A military band will play in the Club enclosure.

The drivers for Germany are officially announced as Baron de Caters, Mr. Foxhall Keene and Herr Jenatz. Reserves, Messrs. Hieronymus and Degnais.

The 110-h.p. Napier car which has just been completed for Mr. S. F. Edge will not be driven in the Cup Race. Although it has been dispatched to Ireland, in any event Mr. Edge will only drive it in some of the other speed trials during the Irish Fortnight.

Four grand stands have been erected from which to view the Race. The leading one is the Automobile Club stand at Ballyshannon, which will be practically reserved for members of the Club. About half a mile further on is the Kilrush stand, capable of seating 3,000 people, the management of which is in the hands of Messrs. Thomas Cook and Sons. A third is the stand erected by Messrs. Mecredy and Percy on Ardscull Moat, and the fourth is at Russelltown. The charge for the two former is one guinea per seat, half a guinea for the Ardscull stand, and 6*s.* for the Russelltown.

Everything possible that can be done to ensure accuracy in the timing has been seen to by Mr. R. E. Phillips, who has undertaken the responsibility of this department. He has just had his chronograph, which he employs with his electrical timing apparatus, again tested at Kew, and it has satisfactorily passed the subsidiary test, its "A" certificate being indorsed. In addition, Mr. Phillips will have with him a chronograph made by the same maker, viz., Mr. H. Golay, of Myddelton Square, which at present holds the record at Kew for marks allotted with an "A" certificate. This will be employed for timing the actual duration of the Gordon-Bennett Cup Race.

The members of the Yorkshire Automobile Club will start from Leeds on June 30th to witness the race. The arrangements include camping in a field at Ardscull, about four miles from Athy, which gives a splendid view for about two or three miles. Two large sleeping tents with wood floors have been erected, and a dining tent thirty feet square. The inclusive charges for the accommodation are upon an extremely moderate basis.

Bearing in mind the fact that every portion of the competing cars must be manufactured in the country represented by the car, it is extremely satisfactory to know that in spite of the bad accident which Colonel Mark Mayhew had through the fracture of the steering gear on his car in the Paris-Madrid race, his Dunlop tyres which are entirely of British make remained intact and unpunctured. The strain must have been fearful at the time of the mishap, and in view of the car having already covered about 320 miles at an average speed of 53 miles an hour, it is all the more gratifying to know that the tyres stood this test without a sign of any weakness. We sincerely hope that the Napier cars representing Great Britain in the race will be equally fortunate in their selection of tyres.

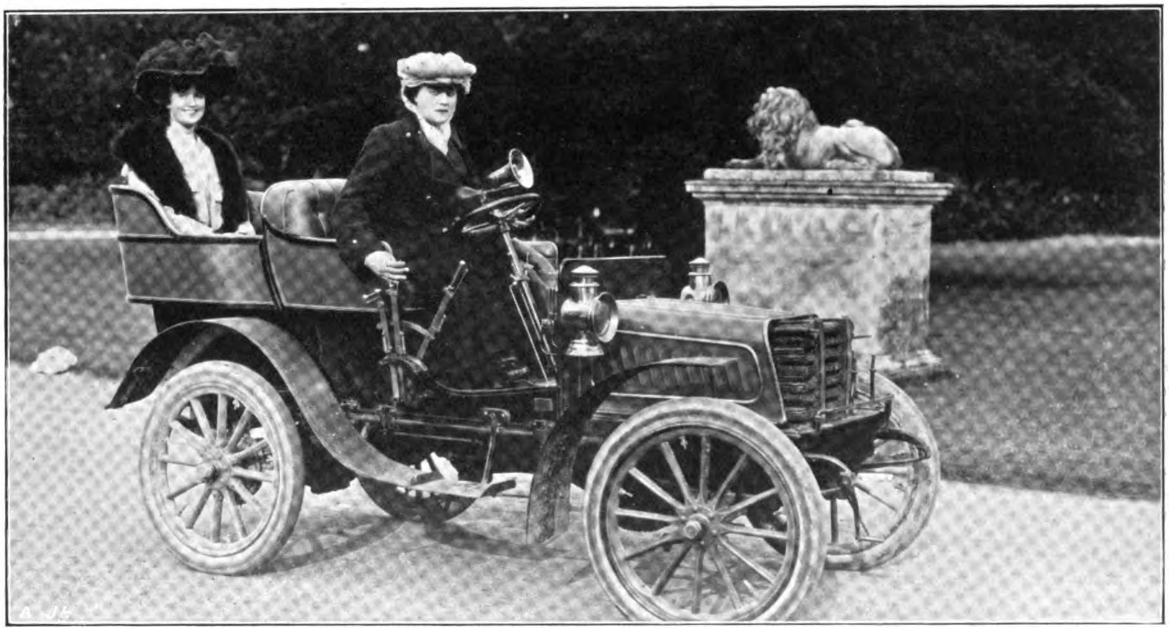
For cyclists and motorists who prefer to camp out privately for the night previous to the race, special arrangements have been made by Mr. A. C. Percy, the editor of our contemporary, the *Irish Wheelman.* He has secured, just behind the Grand Stand at Kilrush, a field of about 8 acres in extent, eminently suited for private camping parties, and he will be pleased to hear from anybody wishing to make use of the accommodation. The spot is about a quarter of a mile from the start.

A distinctly unique card has been issued by the Clincher Michelin Company in connection with the race. On this is given the programme, a skeleton map of the course with the intermediate distances marked, and, in addition, a photograph of a car of each of the four countries engaged, and portraits of twelve of the leading drivers who have been named to represent the various countries.

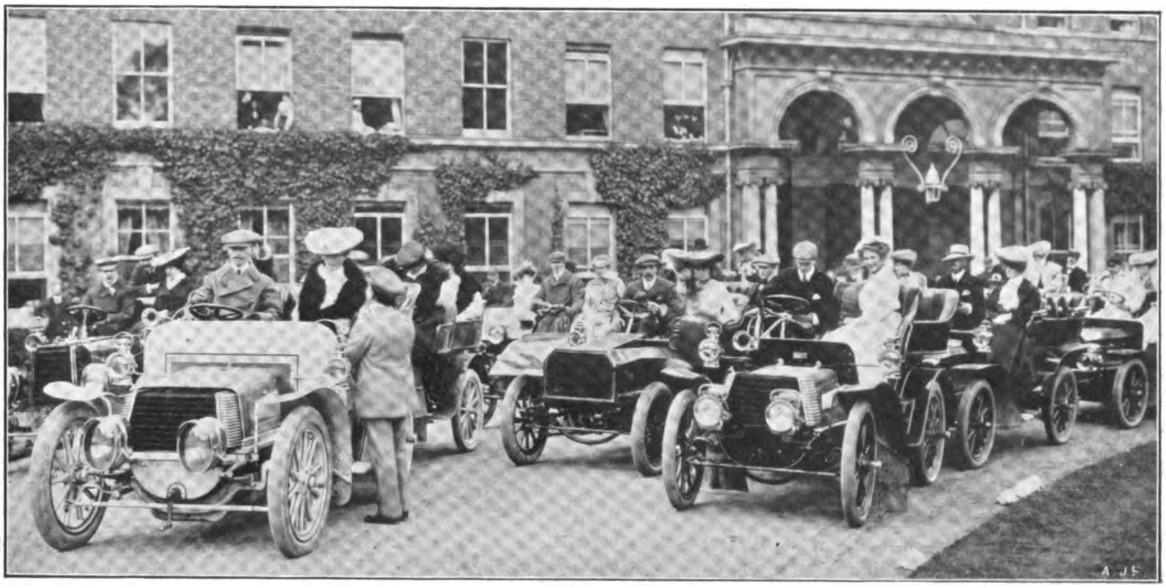
Probably the inhabitants of Weybridge and the neighbourhood are trusting that the Theatrical Ladies' "Motor Meet," which was inaugurated on Monday last, will become an annual fixture. At any rate it resulted in bringing some of the prettiest actresses in London down to Oatlands Park in motor cars, where they were entertained at lunch by the Biograph Company, who ultimately photographed the cars with their occupants in front of the Hotel. The run down was quite unusually adventurous owing to the floods of the previous week not having completely subsided, the trees for instance on either side of the Hampton Court Bridge still standing in some four feet of water. Nearly all the leading motor car manufacturers were represented, and among the guests was Mr. Marconi, who happened to be taking a day's holiday. He is in the centre of the second row in the top photograph on the opposite page. Among the ladies who were conducted on the cars and who are seen in the same group were Miss Evie Greene, Miss Jessie Browne, Miss Lettice Fairfax, Miss Decima Moore, Miss Maggie May, Miss May Wentworth, Miss Pauline Chase, Miss Ruby Ray, Miss Dora Barton, Miss Billie Burke, Miss Lydia West, Miss Sybil Arundel, and Miss Helen Ferrars. There are many advantages attaching to being either the owner or driver of an automobile.

THE THEATRICAL LADIES' "MOTOR MEET" AT WEYBRIDGE.

A group of the Visitors taken in the Oatlands Park Hotel Grounds.

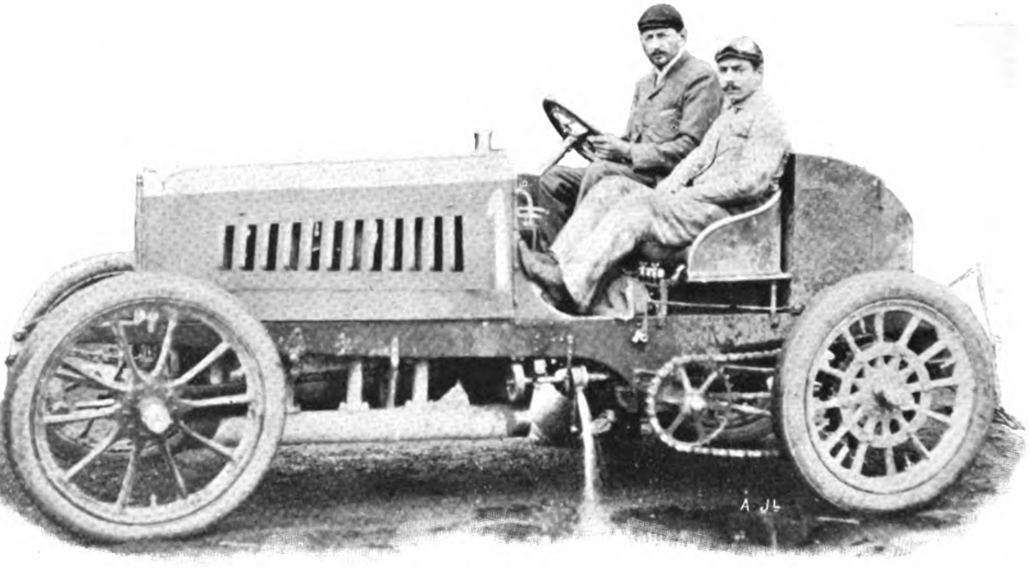


Miss Evie Greene driving a Brooke Car in the Park Grounds. Miss Jessie Browne is seated in the tonneau.



In front of the Oatlands Park Hotel. Ready for the return journey.

Photos by the Biograph Company.

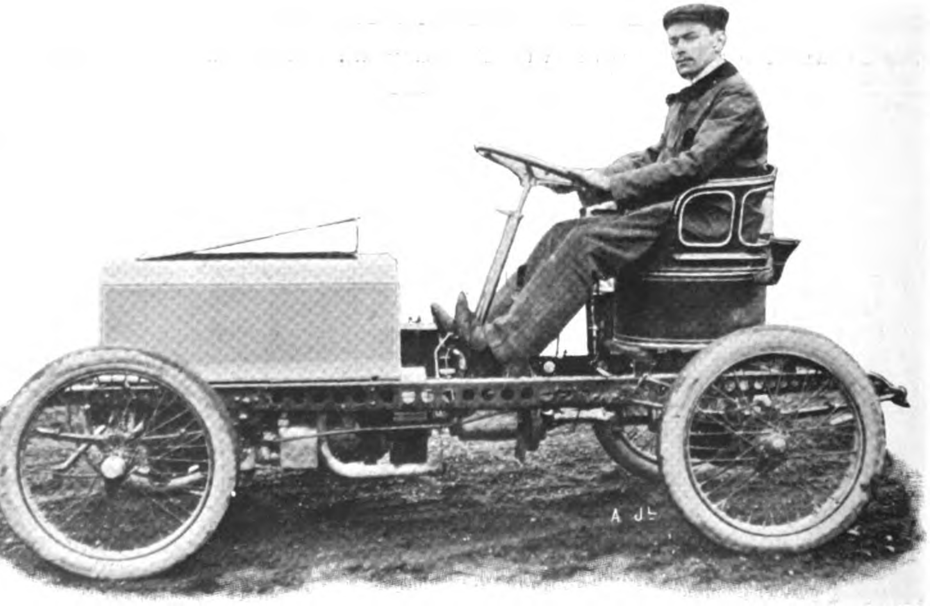


Circuit des Ardennes.—Baron de Crawhez' winning Panhard Car. Time—5 hrs. 52 mins. 7⅜ secs. for the 318 miles. This beats C. Jarrott's 1902 time by 1 min. 32 secs.

CIRCUIT DES ARDENNES.

After the unpleasant sensation created by the Paris-Bordeaux section of the Madrid Race it is with unalloyed pleasure that we are able to record the non-sensational meeting of the Ardennes Circuit which took place on Monday and Tuesday last, practically without a mishap of any serious nature whatever. So far as the public were concerned not the smallest accident has happened, owing, no doubt, to the admirable manner in which the authorities have carried out their part of the bargain in properly protecting the course from intrusion. The method also adopted of sending the cars off so that vehicles only of a relatively equal power were running at the same time on the course eliminated the necessity to a large extent for passing and re-passing. In fact, except that the number of competitors who took part in the Ardennes course is far in excess of the number which will start in the Gordon-Bennett race in Ireland next week, the principle upon which the whole meeting was conducted is very much on the same lines as the Irish Cup race, with the further exception that in Ireland the precautions taken against accident will be about twice as elaborate. The fact of a number of the cars breaking down has resulted in nothing worse than a few slight bruises and damage to the vehicles.

Prior to the Circuit Race, a kilometre speed trial was run off at Huy, and a hill climb near by, which was open to the competitors in the Circuit Race and other cars. The exact spot selected for the kilometre race was between Gisves and Ben, where a perfectly flat stretch is available, giving a clear run of more than a full kilometre for getting up speed. In the result the honours of both this event and the hill climb, which took place in the afternoon, fell to the new 4-cylinder light Benz car, using Continental pneumatic tyres, driven by Barbaroux, his time being 30⅕ secs. for the kilom., giving a speed of 119·2 kiloms. (74·07 miles) per hour. In the hill climb, over a distance of 1·352 kilometres, the time of Barbaroux's Benz car was 45⅘ secs. In both events Baron De Caters, who will drive on behalf of Germany in the Gordon-Bennett Cup, was second on a big Mercedes car, and Villemain third on a Darracq voiturette. The hill was taken with a flying start, there being two fairly sharp turns during the ascent. An enormous number of onlookers had gathered on the course, estimated to number near to 50,000 persons.



Circuit des Ardennes.—Wagner on the Darracq, which heads the Voiturette class with a time of 3 hrs. 55 min. 27⅕ secs. for the Arlon Course of 298 kiloms.

Circuit des Ardennes.—The Masson Brothers on the new 3-cylinder Clement Voiturette. This car was only finished two days before the race.

Subsequent to the official trials, De Caters, who on the hill would have undoubtedly done better had he not been retarded on the 60-h.p. Mercedes, at one of the turnings by a vehicle which had come to rest, made three attempts for a speed kilometre, and succeeded on the third try in covering the distance in 29⅗ secs., creating a Belgian record by ⅕ sec. for this distance.

The chief times for the two events are as follows :—

The Flying Kilometre.

Heavy Cars.—1. De Caters (Mercedes), 31 secs.

Light Cars.—1. Barbaroux (Benz), 30⅕ secs.; 2. Osmont (Darracq), 31⅕ secs. ; 3. Henriot (Clément), 37⅕ secs.

Voiturettes.—1. Villemain (Darracq), 33⅗ secs. ; 2. De Boisse (De Boisse), 45⅘ secs. ; 3. Gauthier (Ader), 46⅘ secs.

Motor Bicycles.—1. Griet (Griffon), 31⅕ secs. ; 2. Demester (Griffon), 41⅗ secs. ; 3. Pascal (Clément), 43⅕ secs.

Hill Climb.

Heavy Cars.—1. De Caters (Mercedes), 48⅕ secs.

Light Cars.—1. Barbaroux (Benz), 45⅗ secs. ; 2. Osmont (Darracq), 46⅗ secs.

Voiturettes.—1. Villemain (Darracq), 54 secs. ; 2. Gauthier (Ader), 1 min. 21⅗ secs. ; 3. M. Fournier (Clément), 1 min. 37 secs.

Motor Bicycles under 50 Kilogs.—1. Griet (Griffon), 54 secs. ; 2. André (Red Star), 1 min. 3⅗ secs. ; 3. Kinet (Antoine), 1 min. 5 secs.

Coming to the Circuit des Ardennes, on Monday, the 22nd, as announced by us last week, the heavy cars were started from Bastogne at 3 o'clock in the morning, the finishing time closing for this class at mid-day, and in the afternoon the light cars were started, having up to 8.30 p.m. to finish. The distance for these two classes was 512·400 kiloms., or six times round the circuit of 85·400 kiloms., the whole of which was without any neutralised portion. On the next day, Tuesday, the voiturettes were dispatched at 7 a.m., finishing at latest at one o'clock, and in the afternoon the motor bicycles were dispatched, finishing not later than 7 p.m. Both these classes started from Arlon, and went round their circuit twice only. Of the 122 entries received—omitting bicycles—57 cars actually started, and of these 29 completed their respective courses. In addition, 14 "groups" of cars were entered for competition for the *L'Auto* Cup the "groups" so entered were as follows :—

Cars.—Pipe, Charron, Girardot et Voigt, Gardner-Serpollet.
Light Cars.—Clement, De Dion-Bouton, Darracq.
Voiturettes.—Ader, Clement, Corre.
Motor Bicycles.—Clement, Minerva, Antoine, Sarolea, Peugeot.

The number of starters and cars, respectively, that finished in each class were :—Cars : 28 started ; 11 finished. Light cars : 16 and 7 Voiturettes : 13 and 11. Motocycles : 35 and 10.

On the first day, unfortunately, the English competitors had extremely bad luck with tyre troubles. Both Mr. Jarrott, who was driving a De Dietrich car, and who last year made such a magnificent record for this course, and Mr. Sydney Girling, who was at the wheel of

Barbaroux on the new 4-cylinder Benz Car, which scored best at Huy in the Speed Kilometre and the Hill Climb.

CIRCUIT DES ARDENNES.—TIMES FOR THE CARS CLASSED.

	Official No.	Drivers.	Make.	Time for each Circuit. 1st	2nd	3rd	4th	5th	6th	Total time for the 318 miles.
		I.—HEAVY CARS (700 *to* 1,000 *kilogs.*).								
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1	1	De Crawhez	Panhard	0 56 40	0 56 16	0 58 2	1 0 10	0 59 54	1 1 5⅗	5 52 7⅗
2	12	Girardot	C.G.V.	1 4 20	1 1 20	1 1 9	1 0 52	1 1 34	1 2 56⅘	6 12 11⅘
3	21	De Brou	De Dietrich	1 0 0	1 0 4	1 16 3	1 5 59	1 2 9	0 56 18⅕	6 24 29⅕
4	26	Le Blon	Gardner-Serpollet	1 3 56	1 4 4	1 1 14	1 6 7	1 3 58	1 11 44	6 31 3
5	54	Beconnais	Darracq	1 9 27	1 2 1	1 21 24	1 8 54	1 3 16	1 3 3	6 48 5
6	8	Coppee	Germain	1 7 40	1 17 23	1 6 24	1 12 30	1 7 55	1 1 22⅗	6 57 14⅗
7	13	Voigt	C.G.V.	1 5 20	1 4 53	1 4 54	1 6 49	1 6 4	1 36 40	7 4 40
8	3	Guders	Pipe	1 16 33	1 11 14	1 10 20	1 14 49	1 7 41	1 9 40⅗	7 10 17⅗
9	20	Hautvast	Pipe	1 55 42	1 45 53	1 7 52	1 22 31	1 12 7	1 5 51⅕	8 26 56⅕
10	28	S. Girling	Wolseley	1 4 2	1 36 12	1 35 51	2 9 49	2 10 0	2 40 0	11 15 54
11	19	De Poele	Pipe	1 12 23	2 8 36	1 23 38	1 15 11	2 16 0	3 10 0	11 25 48
		II.—LIGHT CARS (400 *to* 700 *kilogs.*).								
1	9	Baras	Darracq	1 0 18	1 0 15	0 59 20	1 5 14	1 6 33	1 18 58⅕	6 30 38⅕
2	52	Tavenaux	Gobron-Brillie	1 13 59	1 8 9	1 10 6	1 9 15	1 9 16	1 5 16⅕	6 56 1⅕
3	47	Cagno	F.I.A.T.	1 10 47	1 13 40	1 10 36	1 10 22	1 10 7	1 11 23	7 6 56
4	31	Osmont	Darracq	1 10 0	1 14 55	1 14 0	1 12 59	1 12 45	1 11 51⅗	7 16 30⅗
5	30	Hemery	Darracq	1 13 53	1 5 37	1 7 56	1 16 44	1 29 51	1 19 47	7 33 48
6	42	Journu	De Dion-Bouton	1 29 39	1 2 10	1 29 59	1 25 22	1 18 0	1 17 0	8 2 10
7	43	Bardin	De Dion-Bouton	1 25 38	1 30 40	1 24 50	1 20 40	1 17 0	1 18 0	8 16 48

	Official No.	Drivers.	Make.	Time for each circuit. 1st.	2nd.	Time for 272 kiloms.
		VOITURETTES (250 *to* 400 *kilogs.*).				
				h. m. s.	h. m. s.	h. m. s.
1	1	Wagner	Darracq	2 7 20	1 48 7⅕	3 55 27⅕
2	2	Villemain	Darracq	2 9 53	2 18 0	4 27 53
3	39	Denis	De Boisse	2 10 37	2 28 29⅕	4 39 26⅕
4	33	Vilain	Prunel	2 17 50⅗	2 21 54	4 39 44
5	50	Corre	Corre	2 19 48	2 23 46⅕	4 43 34⅕
6	7	Fournier	Clement	2 26 49	2 29 9⅗	4 55 58⅗
7	6	Masson	Clement	2 45 25	2 29 39⅕	5 15 1⅕
8	4	D'Aubignosc	Ader	2 44 18	2 47 30⅗	5 31 48⅗
9	49	Gautier	Ader	2 45 52	3 5 9⅕	5 51 1⅕
10	51	Persan	Corre	2 59	3 51 40	6 50 40
11	52	Hespel	Corre	3 59 49	2 51 52	6 51 41
		MOTOR BICYCLES.				
1	31	Demester	Griffon	2 14 47	2 44 59⅗	4 59 46⅗
2	24	Andre	Red Star	2 36 53	2 46 33	5 23 26
3	20	Kinet	Antoine	2 18 50	3 7 14	5 26 4
4	43	Momo	Peugeot	2 40 13	2 49 26	5 29 39
5	27	Verechaer	Sarolea	2 18 50	2 36 18	5 30 7
6	15	Flamand	Minerva	2 41 45	2 53 16	5 35 1
7	54	Rene	Red Star	2 22 35	3 19 36	5 42 11
8	48	Barret	Bruneau	3 2 47	3 23 33	6 26 20
9	9	Dacier	Clement	3 43 21	2 44 48	6 23 9
10	11	Oster	Clement	3 4 2	3 26 56⅖	6 30 58⅖

one of the Wolseley racers, suffered very severely in this respect, and rendered it almost hopeless to continue the race, and it is greatly to Girling's credit that he subsequently finished in time to be classed. All Jarrott's tyres collapsed hopelessly. Mr. Lisle, on the Star racer, when rounding one of the sharpest corners on the route at Longlier, 25 kiloms. from the start, parted company with his mechanician who, unfortunately, sustained a fractured ankle. At the same spot Terry, on a Mors car, also came to grief. Becomius also "shed" his mechanic, but no serious hurt resulting he continued with a substitute. Mr. Vanderbilt, who was also driving a Mors, did splendidly on the first round, overhauling no less than fourteen of the competitors who started in front of him. (Time 58 mins. 16 secs., being only 1 min. 36 secs. behind the winner, De Crawhez.) On the second round, however, a cylinder head blew off, and his chances were therefore all over. Mr. Heath, who was driving a Panhard, also retired, whilst neither Mr. Mark Mayhew nor the Hon. C. S. Rolls were able to get across to the starting point. In the result, the Baron de Crawhez, on a big Panhard car, came in first in 5 hrs. 52 mins. 7⅗ secs. for the full distance of 318 miles, beating Jarrott's time for last year by 1 min. 32 secs. Girardot, on a C.G.V. car, came in second in 6 hrs. 12 mins. 11 secs., and Brou, on a De Dietrich, was third in 6 hrs. 22 mins. 29 secs. Baron de Caters, who drove in the kilom. and hill events, did not start. All three of the "Pipe" cars in the heavy class completed the course, as will be seen by our table—a performance which should place them in the front rank for reliability. In the light car class the Darracq firm got the same number through to the finishing point. This year the tourist class was abolished.

On the second day the honours were carried off by the Darracq voiturettes, the two first being both of this make. The course on this day from Arlon was 136 kilometres in circumference, and this had to be covered twice, giving a total of 272 kilometres. It was the first occasion upon which this course has been run over, and therefore there are no times available with which to compare the performances of the cars. The roads were in splendid condition and of good quality. As only 13 voiturettes presented themselves at the starting point, the judges determined to let the bicycles start soon after instead of keeping them back until one o'clock, and consequently the day's racing was finished much earlier than was anticipated. The time of Wagner on the first Darracq was 3 hrs. 55 mins. 27⅕ secs. for the 272 kilometres, and in the motor bicycle section Demester, on a Griffon, came in 13⅗ secs. under five hours.

It will be seen that the proportion of voiturettes which completed the course is a remarkable triumph for this type of car. Above we give the times for those which completed the course.

* * *

FOR a temporary abode a pantechnicon van is by no means to be despised under the conditions which may possibly obtain during the night before the race. A few Irishmen have determined to avail themselves of this method of visiting the course. The interior of the van has been fitted up as a bed and dining room, and the roof will be temporarily converted into a grand stand from which the race can be viewed with perfect comfort with the aid of a few armchairs.

THE JENATZY-MARTINI PETROL CARS.—PART I.

M. JENATZY'S name is so well known in connection with automobile construction in the past that any new cars for the design of which he is responsible, whether wholly or in part, are sure to deserve careful study. The fact that he has recently turned his attention to the improvement of petrol vehicles, after having been chiefly interested in electromobiles, adds rather than detracts from the interest aroused by his latest enterprise. The name Martini is also very familiar, and the class of workmanship which is associated with the Martini works at Liege, where the Jenatzy-Martini cars are now being built, is too well appreciated to need more than passing mention here. The cars are the result of the collaboration of several well-known engineers, and they possess many novel features, which will be found to render them highly interesting.

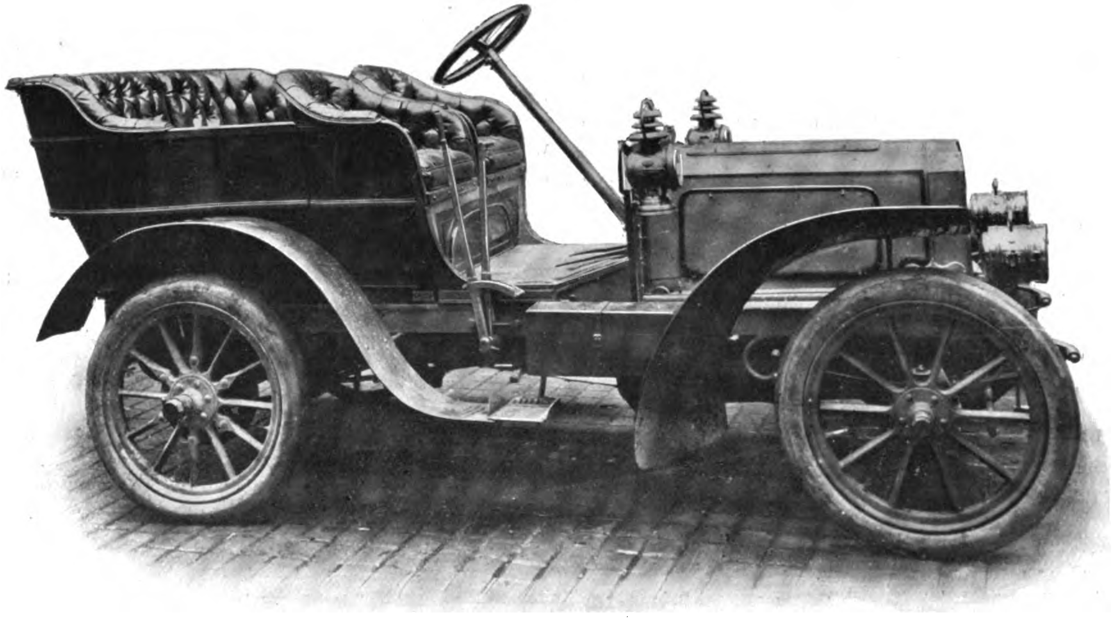


FIG. 1.—A 20-h.p. Jenatzy-Martini Car.

In outward appearance these vehicles are very similar to others in which a live-rear-axle is employed, and in which the power is transmitted to it from the engine through a main clutch, through a change-speed gear of the sliding spur-wheel type, and through a universally-jointed propeller-shaft. The now popular direct-through drive on the top speed has been adopted, and a radiator of the honeycomb type, forming the front of the bonnet, is found on them; it should, however, be stated that the radiator on existing cars is not, strictly speaking, of the honeycomb type, for it is built up of tubes provided with fins threaded over them; a true honeycomb will be fitted on future models, and a fan provided for use with it.

The novel points in the car are:—(1) The construction of the cylinders, and of their heads and jackets. (2) The arrangement of all the valves vertically in the cylinder-heads. (3) The method of operating the low tension igniters by means of magnetic actuators instead of mechanically. (4) The construction of the carburettor itself, and of a special throttle-valve device, designated the obturator, which is controlled automatically by the centrifugal governor, subject to an accelerator pedal. (5) The arrangement of the valve-gear, operating the inlet valves mechanically, so as to allow the quantity of mixture drawn into the cylinder to be varied; this device is regulated by hand from above the steering-wheel, and also provides means by which the valves can be held open so as to relieve the compression entirely. (6) The construction of the steering-gear in a particularly substantial manner, and so that the levers which control the lift of the inlet valves, which vary the time of ignition, and which regulate the richness of the explosive mixture, respectively, are all mounted above the steering-wheel. (7) The provision of a forced system of lubrication to the bearings, the pressure being maintained in the oil reservoir by a gear-driven pump. (8) The arrangement of the electrical apparatus in such a manner that the accumulators can be recharged by the engine, and that the necessary current is available for lighting the electric carriage lamps.

The Jenatzy-Martini cars are being made in two sizes, the one having a twin-cylinder and the other a 4-cylinder engine. The smaller engine is nominally of 12-h.p. but develops 15-h.p. on the brake. The larger engine is capable of giving 28-b.h.p at 1,200 revs. per minute, although nominally of only 20-h.p. The two cars are, in general respects, similar to one another, although, of course, of different size, so that the following description of the 20-h.p. car, which we have recently examined in some detail, applies, for the most part, to both.

The entire output of the Liege factory, except as regards the supply in Belgium itself, has now been secured by the Petrol Motor Power Company, Limited, of Carteret Street, Westminster, who are already prepared to supply a few of the smaller cars, and will shortly be in a position to give delivery of the larger type. The vehicles have already obtained a considerable reputation on the Continent, several well-known automobilists over there, including Baron de Zuylen, Baron de Caters, Baron Von Toels, and Baron de Minette being amongst those owning them. The only car which, up to now, has been seen in this country is that from which our photographs were taken, and which has since then been sold to Mr. Herbert Ingram, a member of the Automobile Club.

The general appearance of the 20-h.p. car can be gathered from Fig. 1. The body is fitted with a detachable tonneau, and has comfortable arm chair seats in front. For touring, its special design is, in our opinion, particularly well suited, being both useful and attractive. Needless to say, it is well finished, and the upholstery is good. The wheel base is of ample length. The cars are fitted with 810 by 90 mm. wheels, and the racers with 36-inch wheels. The main frame is constructed of wood and steel, and the engine, together with the gear box, is carried on a separate underframe. The front springs are semi-elliptic ; at the rear the semi-elliptic side springs are connected together at their back ends by means of a transverse spring passing across beneath, and attached centrally to, the main frame.

The engine is shown in position in the car in Figs. 2 and 3, the former being taken from the left and the latter from the right side. The cylinders are made of steel, and each pair of them is fitted with a water-jacketed head, which contains the inlet and exhaust valves, on top, and the ignition plugs on its one side. The cylinders themselves are provided with brass water jackets, the jacket for each pair of cylinders being in one piece. The heads and the jackets are held in place by long bolts, which pass through them to the crank-chamber, and have nuts which press down on the top of the heads. The brass jackets themselves are also soldered in place. The cylinders have a bore of 110 mm., and the stroke is 130 mm.

The crank-chamber is made of aluminium, and is arranged so that the cams which operate the valves are enclosed. These cams are all carried upon the same shaft, on the left side of the engine. The valves fit down into openings in the cylinder head, and are held in place by screwed nipples, which are tightened or slackened by means of a special tool provided for the purpose. All the valves are similar. The castings forming their seats, which are removable with the valve itself, are provided with ports in their sides to allow of their removal without disturbing the induction or the exhaust pipes. The valves on the left side are the exhaust-valves (A), and those to the right are the inlet-valves (B).

The exhaust valves are operated by vertical rods, A^1, which are adjustable as to length, and are connected at their upper ends to small pivoted levers, A^2, which, at their other ends, engage with the valve spindles. A common port leads from both exhaust-valves through the cylinder head, so that one arm of the branched exhaust pipe, A^3, serves for each pair of cylinders.

The inlet-valves are operated by vertical rods, B^1, which lie between the rods, A^1 (actuating the exhaust-valves). The lower ends of the rods, B^1, are pivoted to the upper ends, and the upper ends are carried in guides. At the bottom of each rod, B^1, there is a roller which rests upon the curved face of a fulcrumed lever, which is caused to rock up and down by its inlet cam (on the cam-shaft). The rocking levers are fulcrumed on the pins, B^2. The lower ends of the rods, B^1, can be moved so as to bring their rollers nearer to or further away from the fulcrum. This is done by rocking the shaft, C, in its bearings, the shaft being connected with the rods, B^1, by lever arms, C^1, projecting from the shaft, and by links. The shaft, C, is caused to make a partial rotation in its bearings by the driver, and is for this purpose connected with a hand lever above the steering wheel. The effect of operating the lever is to cause the small rollers at the base of the rods, B^1, to approach or recede from the fulcrum pins, B^2, by moving them along the curved face of the rocking levers, with the result that the rods, B^1, are moved vertically to a greater or to a less extent by the inlet-cams. The rocking levers are of such a length and shape that, if the rollers are moved along to their extreme end, the rods, B^1, are not only moved by them over a greater range but are not allowed to travel so far in a downward direction as they do normally ; the inlet-valves are then held open and are not allowed to shut. The rods, B^1, are caused to operate the inlet-valves by means of the mechanism which is arranged across the top of the cylinder heads. This mechanism consists of two short shafts, B^3, which are carried in bearings and have projecting arms, B^4 and B^5, at either end. The arms, B^4, lie above the rods, B^1, and the arms, B^5, operate the inlet valves, B, by pressing down on their spindles ; the arms, B^5, are provided with small rollers at their ends for this purpose. Similar ports lead the explosive mixture from each branch of the induction pipe, K, to each pair of inlet-valves in the same way that the exhaust gases are led from the exhaust-valve to the branched pipe, A^3, as already explained.

The crank-chamber is fitted with two large removable doors beneath the base. The rear end of the cam-shaft carries a centrifugal governor, and the forward end carries a distributing commutator of usual construction. The commutator is mounted so that the time of ignition can be varied by rocking its stationary portion about its axis in the ordinary way. The two to one gear wheels driving the cam-shaft are enclosed. The governor is connected by a system of levers, leading across to the other side of the engine, with the obdurator, J (Fig. 3), the details of which will be given presently ; one of the rods, J^1, connecting it with the governor is seen in Fig. 3. A foot accelerator is arranged so as to interact with the governor system, and so regulate the normal speed of the engine. The circulating pump is gear-driven, and is on the right side of the crank-chamber ; it is not visible in Fig. 3, as it lies beneath the dynamo, E, which, however, is there prominent.

The ignition plugs, F, fit into the cylinder heads on the right-hand side. They and the magnetic actuators, G, which operate them, are more clearly shown in Fig. 4. The plugs themselves resemble many others of the low-tension type. An uninsulated rocking spindle, F^1, passes through the body of the plug, carrying projecting arms, F^2 and F^3, on either end. An insulated contact pillar, F^4, is fixed through the plug. The rocking arm, F^3, is normally held in contact with the stationary pillar, F^4, by means of an external spring, F^5, and the electric circuit is, therefore, normally closed. The actuator, G, consists of a solenoid having an iron core, G^1, which is normally held down by an enclosed spring. When the current passes through the coil the core is drawn upwards, and the hardened steel tip,

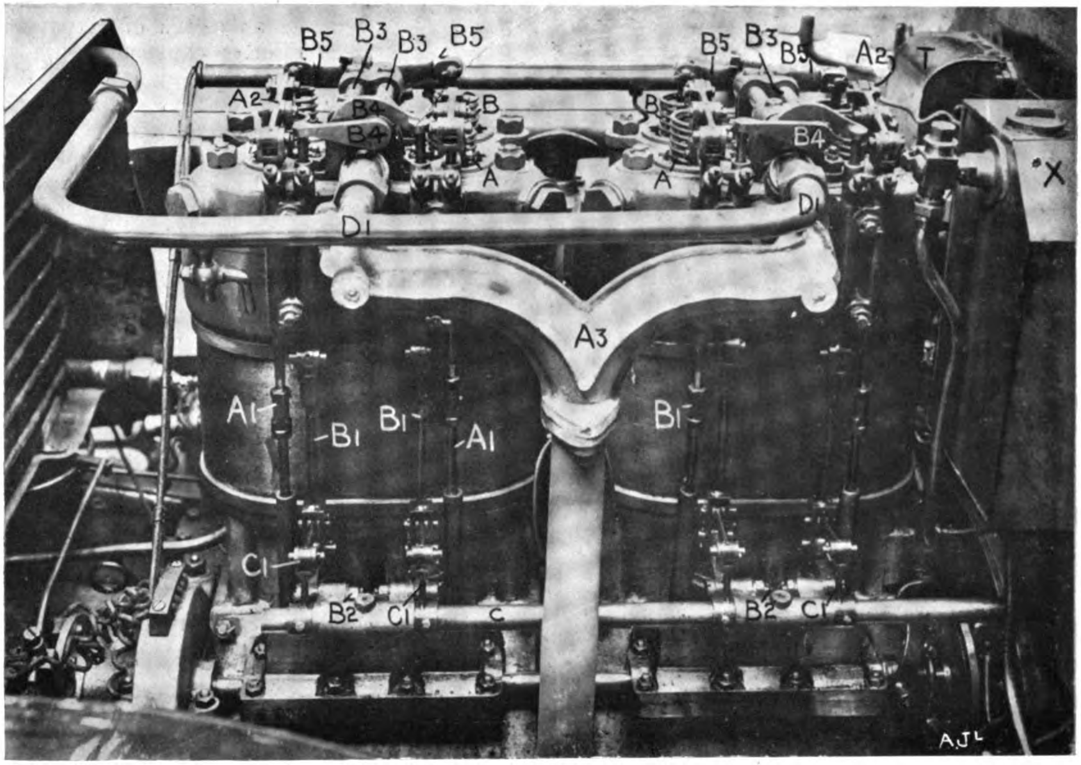


FIG. 2.—View of the engine in place (from the left).

G^2, which is connected with it by the rod, G^3, then strikes the arm, F^2, of the igniter, driving it upwards, breaking the circuit, and thus causing a spark in the usual way. The solenoid takes the place of the usual intensity coil which is employed in connection with low tension igniters, when a battery or dynamo is employed for furnishing the current;

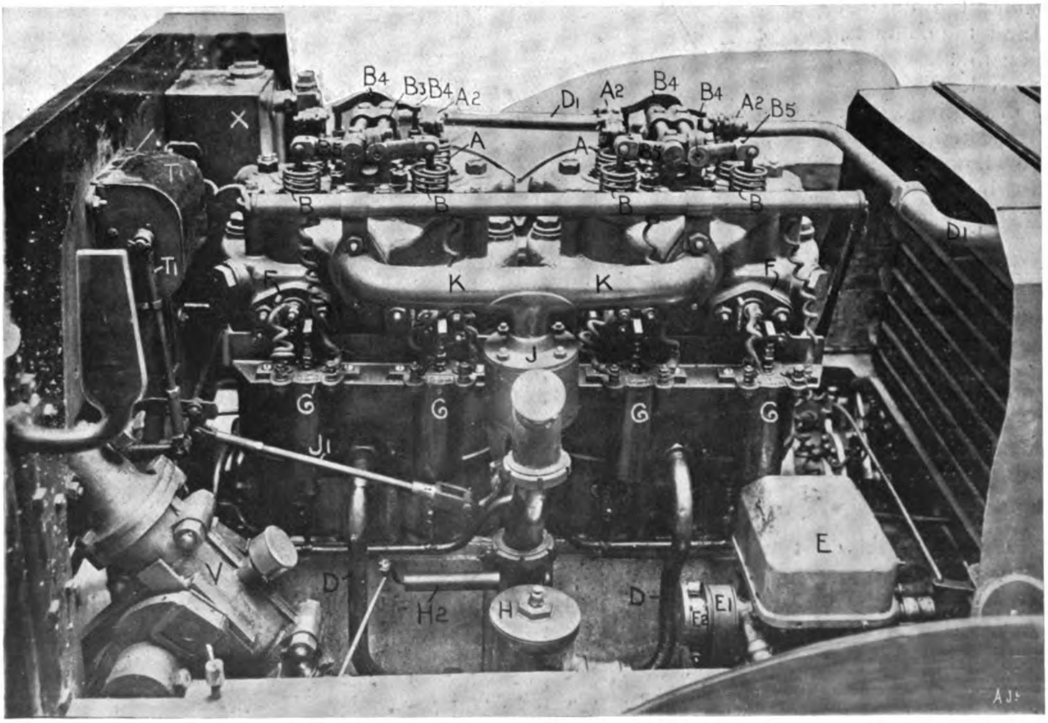


FIG. 3.—View of the engine in place (from the right).

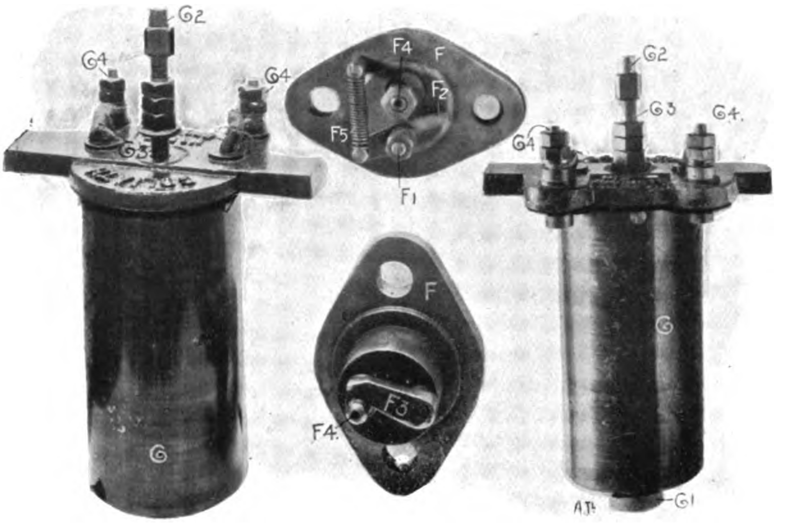


Fig. 4.—Two views of the low tension igniter, and of the electro-magnetic actuator.

it, therefore, in this case, serves a double purpose. The coil is joined up in series with the igniter, the current passing from the commutator to one of the terminals, G^4, and from the other terminal, G^4, to the insulated pillar, F^4, of the plug, so that as soon as the circuit is broken inside the cylinder the core is allowed to fall, and the contacts, F^3 and F^4, are again allowed to come together inside the cylinder; the same disruptive action would then be repeated, if sufficient time were allowed. The commutator distributes the current alternately to each of the four igniters, just in the same way that it usually distributes it to high tension coils, except that the entire commutator is insulated from the cam-shaft. It should be particularly pointed out that when the engine is running slowly enough a series of sparks is produced in the cylinders instead of only one.

Magnetically-operated igniters have previously been tried, but, so far as we are aware, without success. We believe that the great difference between them and the Jenatzy-Martini device, from the point of view of success, is that no attempt has in this case been made to combine the solenoid and the igniter into one single piece of apparatus. The moving core essentially has sufficient weight to make its inertia of importance, and if it were directly connected with the moving member of the igniter, it would hardly have time to get under weigh before the electrical circuit through the solenoid were broken, so that no proper sparks would be formed for two reasons—one, because the contacts would not be moved far enough apart, and the other, because there would be insufficient time for the solenoid to become fully energised. In this device a very quick break is assured, and what lag there is in the action of the apparatus can be compensated for by advancing the commutator to a suitable extent.

The carburettor (H) and the obturator (J) are shown in Fig. 5. The chief peculiarity of the former is the arrangement of the float in its chamber, H. The petrol enters at H^3, and its flow into the float chamber is regulated by a small valve, H^4, which is carried by a light lever, H^5, pivoted on a pin, H^6. The end of the lever, H^5, engages in a stirrup fitted to the underside of the float,

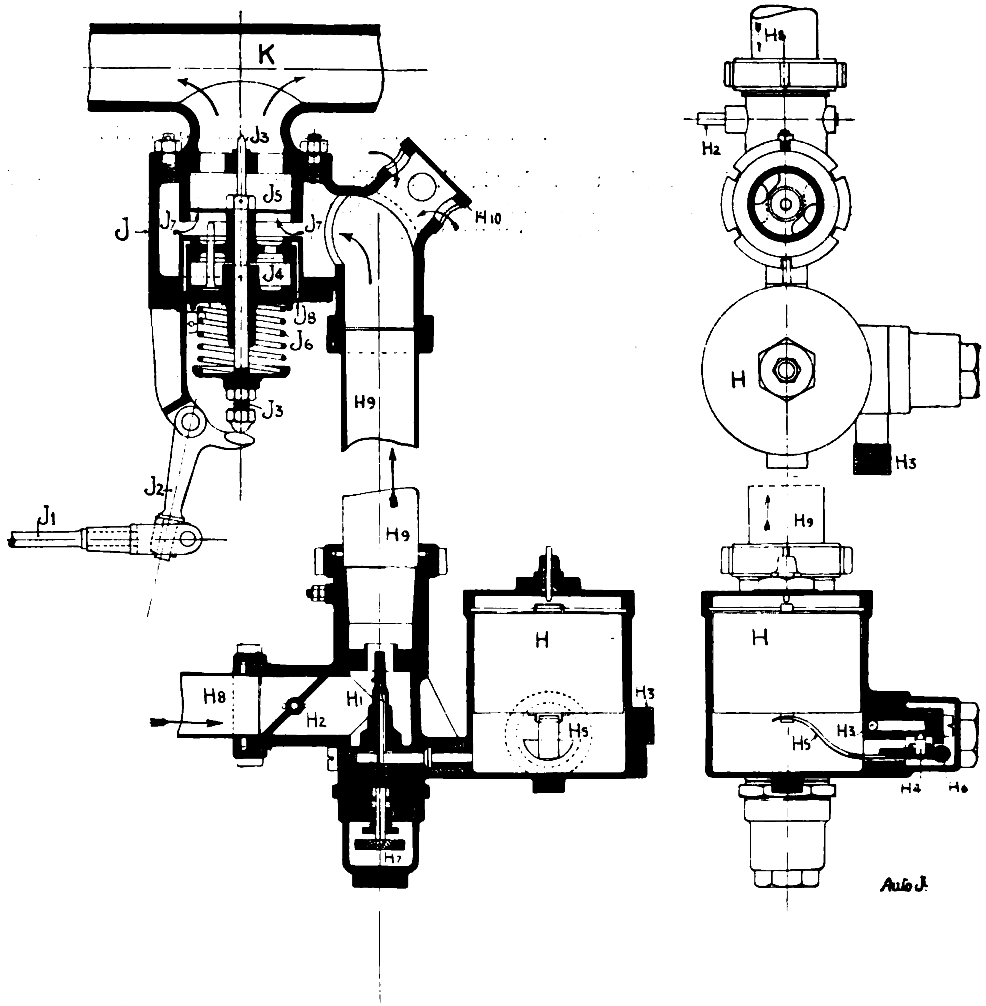


Fig. 5.—The carburettor and the obturator. Vertical section of both, also plan and cross section of carburettor.

so that as the float rises it closes the valve, H^4. The petrol flows from the float chamber to the nozzle, H^1, in the usual way. The size of the orifice through the nozzle can be regulated by the needle-valve, H^7. The warm air supply, which is taken from the neighbourhood of the exhaust-pipe, enters the mixing chamber past a butterfly throttle-valve fitted in the supply pipe, H^8. The explosive mixture is taken to the obturator through the pipe, H^9, at the top of which an adjustable quantity of auxiliary air is admitted into the pipe through the fitting, H^{10}. The butterfly-valve is mounted on the spindle, H^2, and is controlled by the driver from a lever above the steering-wheel. The richness of the mixture is regulated by adjusting this throttle-valve, and by setting the fitting, H^{10}. to admit more or less fresh air.

The obturator, J, is a throttle-valve of somewhat unusual construction, and is, as has already been said, operated by the centrifugal governor, subject to the accelerator pedal, through a system of levers of which J^1 forms a part. The lever, J^1, is articulated to a bell-crank lever, J^2, so that the latter tends to raise the spindle, J^3, as the speed of the engine increases. The spindle, J^3, is fixed to a piston, J^4, and to a perforated baffle-plate, J^5; it is normally held in its lowest position by the spring, J^6. The piston, J^4, fits a cylindrical portion of the apparatus, into which the explosive mixture is normally free to enter through the ports, J^7. As the piston, J^4, is forced upward, it gradually closes the ports, J^7, and when these ports are entirely closed the piston then uncovers small ports which are formed in the walls of the cylinder and open out into it just below the larger ports, J^7. The smaller ports communicate with the atmosphere at J^8, so that, when the supply of explosive mixture is entirely cut off, fresh air is admitted to the working cylinders, tending to cool them.

(*To be continued.*)

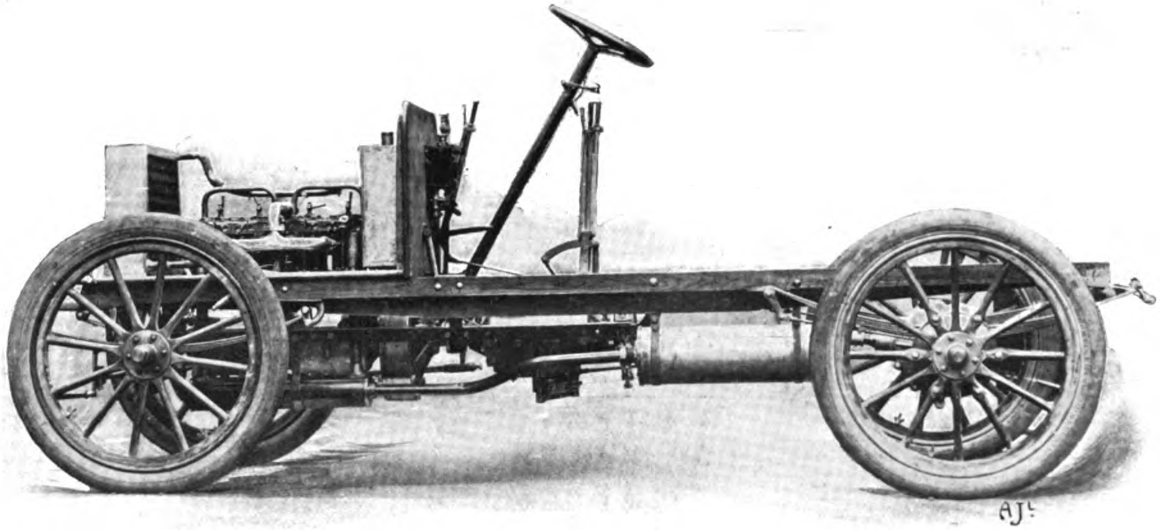


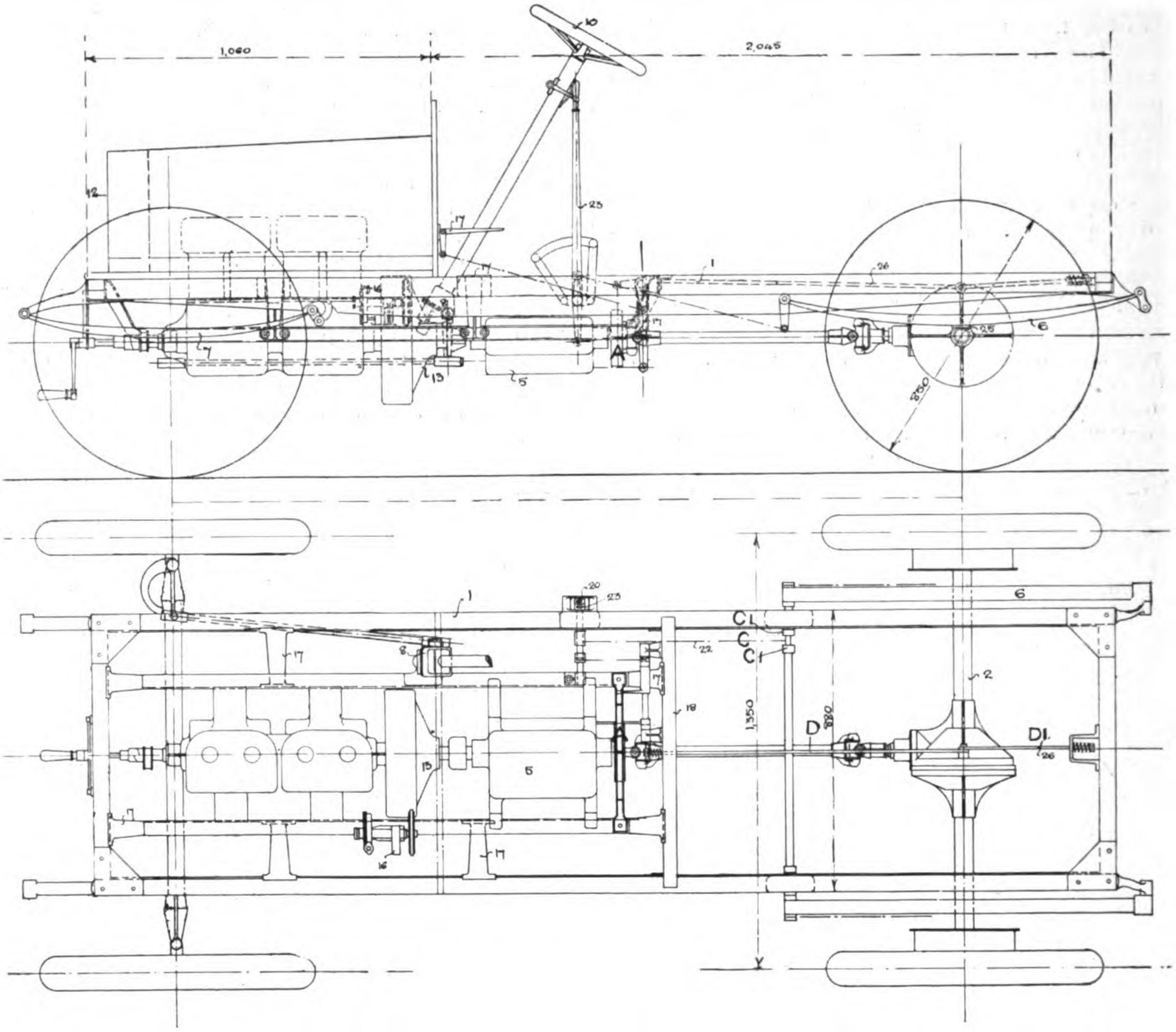
FIG. 1.—The Simms Petrol Chassis.

THE SIMMS "WELBECK" PETROL CHASSIS.

IN our issue of April 18th last we gave an illustrated description of the 4-cylinder petrol engines made by the Simms Manufacturing Company, of Bermondsey. The company have now put on the market a standard chassis suited for either of them, and are prepared to supply it complete or any of its component parts separately.

The chassis resembles many others of the live-axle type. Its appearance will be gathered from the photographic side-view, Fig. 1, and its design is clearly seen in Figs. 2 and 3, which are a side elevation and a plan of it respectively. The main frame is of armoured ash, and the underframe is constructed of angle steel. The wheel base is about eight feet. The main clutch is of the cone type, and a flexible connection is provided between it and the gear-box. It has three forward speeds and a reverse, and there is a direct-through drive on the top speed.

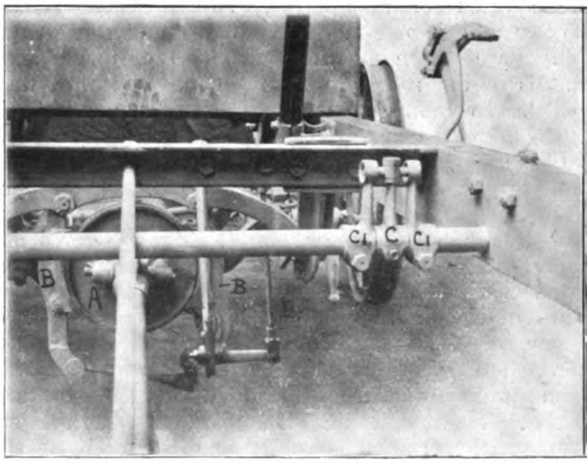
The special features are the double-acting brake, which is mounted immediately behind the gear-box on the gear-shaft, and the compensating mechanism employed for equalising the pull on the side brakes when the lever applying them is operated. These two portions are clearly seen in Figs. 4 and 5. Referring to them, it will be noticed that the brake-blocks, B, are pivotted to the frame so that they lie on either side of the brake-drum, A. These blocks are drawn together by a kind of toggle action by means of the rod, B^1, which is connected with the foot-pedal. In Fig. 4, C is a lever arm, in the end of which a freely mounted pin engages with other arms, C^1, lying on either side of it. The arm, C, is rigid, with a transverse rod carrying the hand-lever at its extreme end, and the arms, C^1, are fixed to independent sleeves, which are mounted freely outside the rod. These sleeves at their other ends are fitted with other arms, which in turn are connected with internal expanding brakes fitted in the hubs of the driving wheel. The steering gear is of the screw type, and is connected with the steering heads through a spring coupling, which prevents shocks from being transmitted from the road-wheels to the steering-wheel. Tie-rods, D and D^1, provided with small springs, connect the casing enclosing the differential gear with the frame in front and behind. The 4-cylinder Simms engines are made in two sizes, one giving from 20 to 24 h.p. and



FIGS. 2 and 3.—Side Elevation and Plan of the "Welbeck" Chassis.

the other from 30 to 35 h.p. Either of these can be fixed in this chassis, and the transmission gear is of sufficient strength for the maximum power developed.

Simplicity has been aimed at in the design throughout, and whilst the weight has been reduced as far as possible, yet strength has not been sacrificed in consequence.



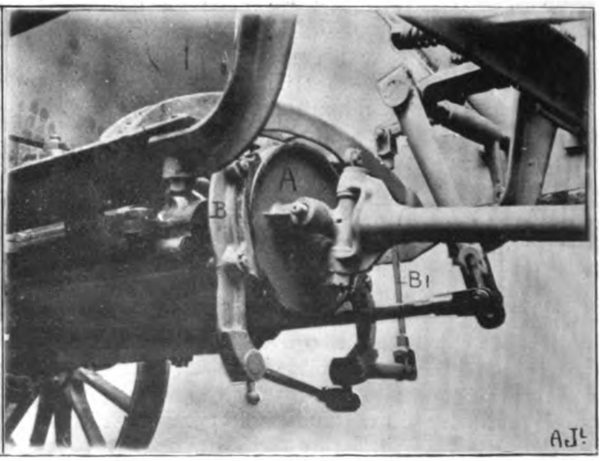


FIG. 4.—Part of the Chassis, showing Footbrake on Gear-shaft, and Compensating Gear for Side-brakes.

FIG. 5.—Another View of Footbrake.

THE WELLER PETROL CARS.—Part III.

(*Continued from page* 637.)

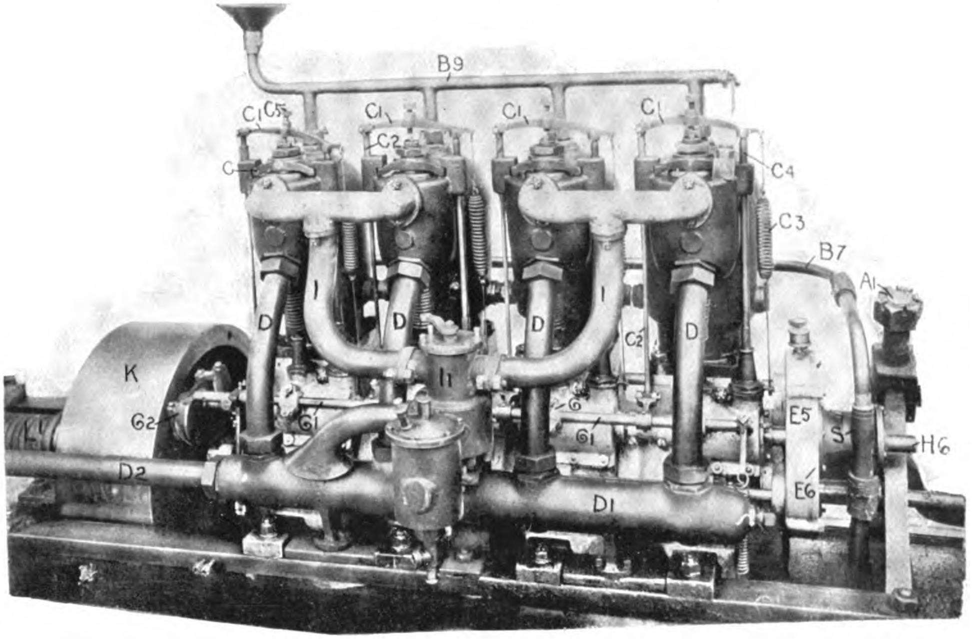


FIG. 13.—The 4-Cylinder Motor fixed on Underframe (Valve side).

The Engine.

ONE of the 4-cylinder engines fixed in place on the underframe is seen from each side in Figs. 13 and 14. This is the engine which is fitted in the car from which all of our photographs were taken. It is nominally of 20 h.p., the cylinders have a bore of 4 ins., and the stroke being 5 ins. In future a new and improved design is being adopted instead. In it the bore of the cylinders is increased to 4½ ins., so that the power of the 4-cylinder model is raised to 30 h.p. The new design is shown very fully in Fig. 15, and the parts of the engine which are illustrated in Figs. 16 to 23 also refer to the new type.

The cylinders, B, are shown separately in Figs. 16 and 17, the former being a cross-section through one of them, and the latter showing a cylinder-casting from two different points of view. The valve-chamber is arranged in much the usual way, so that the inlet-valve is placed vertically immediately above and facing the exhaust-valve. The induction pipe, I (Figs. 13 and 15), is bolted to the casting, so that it communicates with the port, B^4, leading to the inlet-valve. The inlet-valve itself is so made that it can be lifted out bodily with its seat, without disturbing the induction pipe. This valve is held down by means of a yoke, C, the ends of which rest beneath projections, B^3, formed in the cylinder-casting. The yoke is so constructed that a nipple, which screws into it and surrounds the valve spindle, forces the valve seating down in place, and allows it to be easily removed again when required. The end of the valve spindle projects up above the screwed nipple, and the valve is normally closed by a spring in the

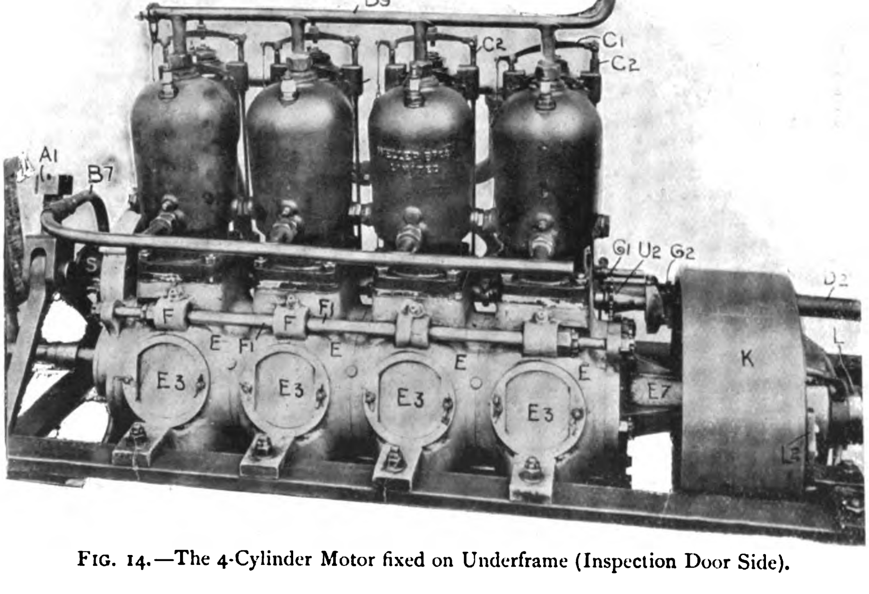
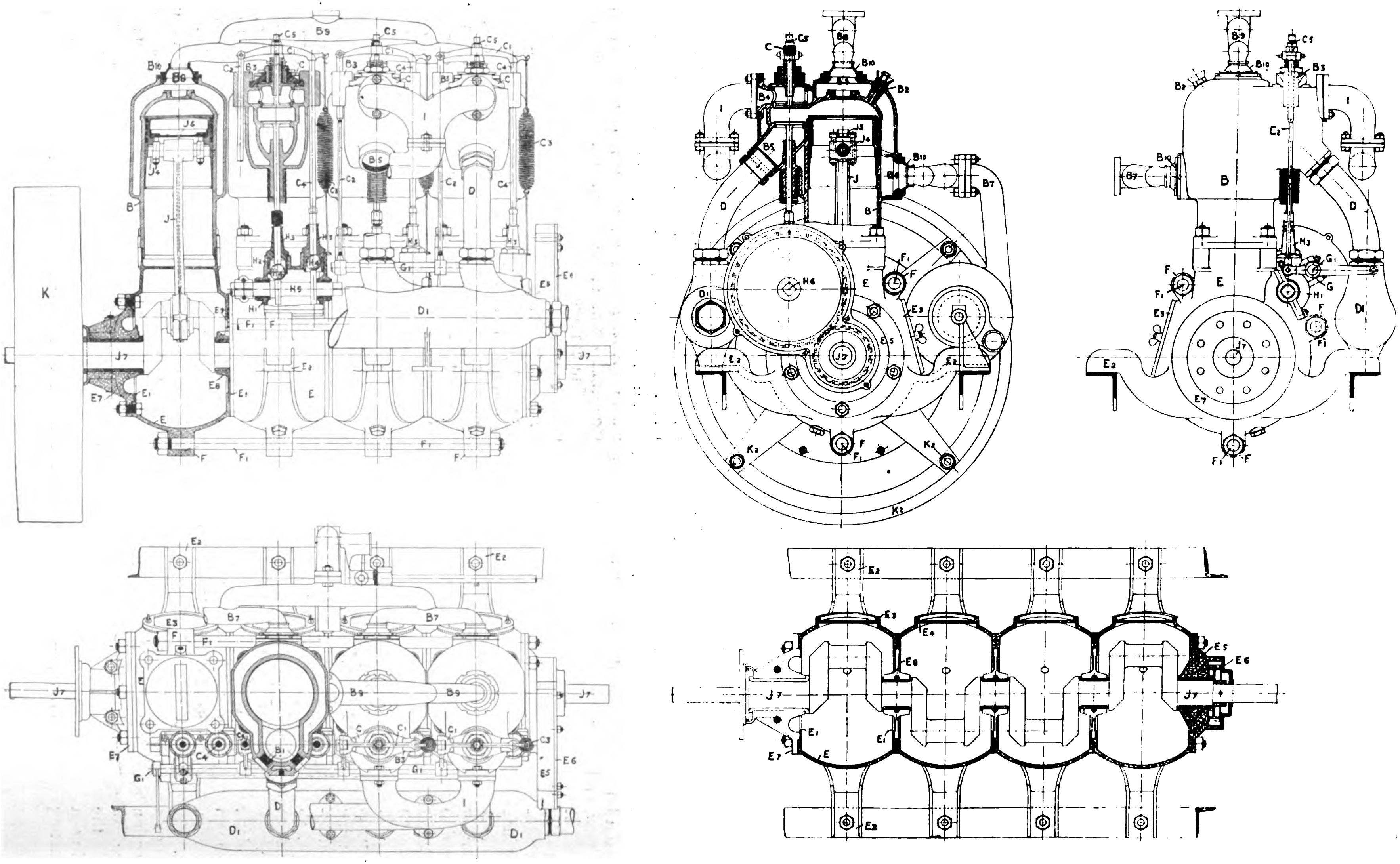


FIG. 14.—The 4-Cylinder Motor fixed on Underframe (Inspection Door Side).

Side elevation and section. (Section through cylinder No. 1. Section through valve chamber and valve gear of cylinder No. 2. Elevation of No. 3, with inlet and exhaust pipes cut away, and true elevation of No. 4.)

Front elevation, with cylinder and valve chamber in section.

Rear elevation, with flywheel removed.



Plan. (Cylinder No. 1 removed. Section through cylinder head and valve chamber of No. 2)

Horizontal section through crank-chamber and crank-shaft.

FIG. 15.—The 30-h.p. Weller Petrol Engine, showing details of construction.

usual way; the spring, however, is stronger than those which are employed with atmospheric valves. The projections, B^3, on the cylinder casting also form bosses through which holes are drilled in such a way as to form guides for two vertical rods which mechanically operate the valve; these rods will be referred to again presently. The exhaust valve is of the usual form, and does not call for any special mention: it is closed by a spring, and its spindle passes downward through a long guide formed in the cylinder-casting. The exhaust pipe, D (Fig. 13), is connected by a union-joint to the cylinder at B^5.

Two bosses, B^1, are provided for receiving high-tension ignition plugs, the spark points of which project into the valve-chamber between the inlet and exhaust valves. Provision is also made in the cylinder-casting at B^2 for the reception of a half-compression device, which consists of a small non-return valve; it can be opened inwardly against the action of the spring by hand; the valve-fitting is also so made that paraffin can be conveniently introduced to the cylinder through it.

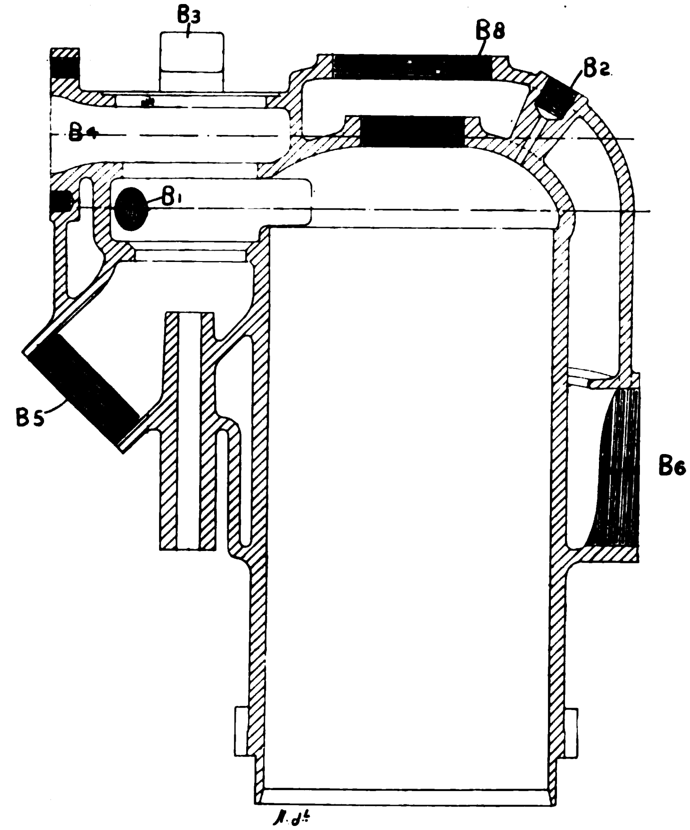


FIG. 16.—Cross-Section through one Cylinder.

The water-jacket is of considerable size, and passes round the greater portion of the valve-chamber: the water is let in at B^6 and out at B^8; these holes are of unusual size, in order to receive special pipe fittings, which will be described later. A baffle is arranged above the inlet hole, so that the water is compelled to pass around the entire jacket instead of flowing straight through it. As already said, each cylinder is a separate casting, so that the one pattern is applicable for engines having any number of cylinders.

The construction of the crank-chamber is well shown in Figs. 18 and 19, which together show all the different standard parts which are required for either size of engine. For the 4-cylinder model, four of the main castings, E (similar to that seen from two points of view in Fig. 18), are required, and of the castings which are seen in Fig. 19, one of each of the parts marked E 5, E 6, and E 7 respectively, and four of the pieces marked E 8 and E 9 are necessary. The main castings, E, may be regarded as separate crank-chambers for single-cylinder engines. They are made of aluminium, and are formed (1) with projecting feet, E^2, by which the engine is fixed in place; (2) with projecting bosses, F, for the reception of steel rods which hold the complete crank-chamber together; (3) with inspection doors, E^3, which fit into openings, E^4, in their one sides; and (4) with cam-chambers, H, having removable covers, H^1, which provide the bearings for the cam-shaft and completely enclose the cams. The ends of these main castings, E, are open, and are turned with a slightly tapered machined face, E^1. The castings are also shaped so as to receive a cylinder in the usual way above them, the cylinder being bolted to them by four studs.

By comparing Figs. 18 and 19 with Figs. 14 and 15, the method of building up the crank-chamber for a 4-cylinder engine will be rendered clear. The main castings, E, are drawn tightly together by means of three steel rods, F^1, which pass through the bosses, F, on each of the separate

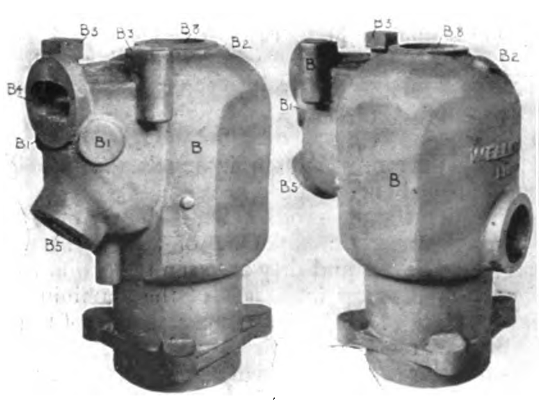


FIG. 17.—Two Views of Cylinder Casting.

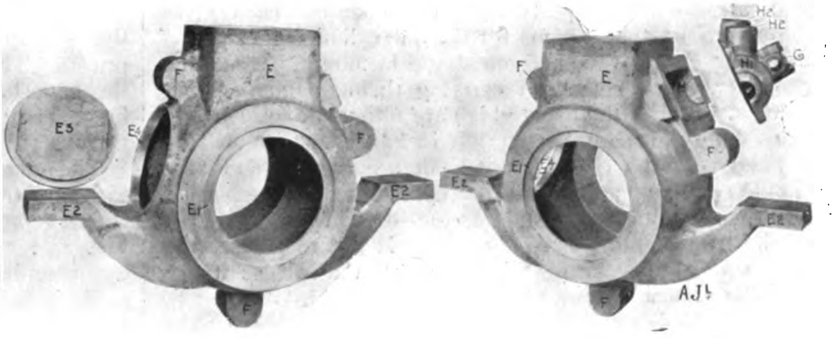


FIG. 18.—Two Views of Crank-Chamber.

compartments. These rods also pass, in the older design, through corresponding lugs which form part of the end castings, E^7 and E^5, but in the new design the end castings are bolted on by separate bolts. The casting, E^5, encloses the two-to-one-gear wheels driving the cam-shaft, and is provided with a detachable cover, E^6; it is seen from both sides in Fig. 19. The face joints on the end castings, E^7 and E^5, fit the machined openings, E^1, in the main castings, and provide the end-bearings for the crank-shaft. Intermediate bearings for this shaft are also fitted between each compartment of the crank-chamber, these being formed by the castings, E^8 and E^9 (Fig. 19), which have machined taper faces near their periphery of precisely the same form as those on the end castings. Each of the intermediate bearings is therefore clipped securely in place between each two adjacent main castings, the steel rods, F^1, holding them with the same degree of pressure as they hold the other parts together.

The joints between the various parts of the crank-chamber are slightly tapered in order to render them self-aligning when the nuts on the steel rods, F^1, are tightened up. The inspection doors, E^3, are held in place by a simple fastening, and allow the bearings on the crank-shaft to be got at easily. Each portion of the crank-chamber carries its own supply of oil, which is fed to it by a separate pipe from the lubricator, and the oil is splashed up by the connecting rod, so as to lubricate the moving parts. The cam-chamber, H, receives the inlet and exhaust cams for the one cylinder, these cams being cut out of the solid metal and forming a part of the short length of cam-shaft carrying them. One of these lengths, H^5, with the discs which are ultimately formed into cams upon it, is shown separately in Fig. 20, and it will be noticed that the ends of the shaft are squared so that a simple coupling can be used for connecting them together, and thus forming the complete cam-shaft. The cover, H^1, of the cam-chamber is so shaped (at H^2) as to receive the guides for the push-rods which operate the valves; it also provides a small external bearing, G, for a rod, G^1 (Fig 13), to work in, this rod, G^1, forming a part of the governor system.

The exhaust cam lies immediately beneath the exhaust-valve, lifting it and allowing it to close in the usual manner. The inlet cam acts upon a long vertical rod, C^4 (Figs. 13 and 15), which engages at its upper end with a pivoted bridge-piece, C^1, passing across above the inlet-valve. The effect produced by the cam lifting the rod, C^4, is that an adjustable set screw, passing through the centre of the lever, C^1, is lifted upwards away from the end of the inlet-valve-spindle, and the valve is thus allowed to close. The bridge-piece, C^1, is pivoted at the other end to the top of another vertical rod, C^2, which at its lower end is fulcrumed to a lever arm fixed to, and projecting from, the governing shaft, G^1, already mentioned. The action of the governor, G^2, on the rod is to turn it about its axis in the bearings, G, and when the speed of the engine increases, to thus slide the rod, C^2, upward, so causing the bridge, C^1, and its set screw to move away from the end of the valve spindle. The inlet-valve is opened by means of a strong spring, C^3, which lies to the right of the rod, C^4. The spring is secured at its upper end to the end of the bridge, C^1, and is fixed adjustably at its lower end to the crank-chamber. The inlet valve, therefore, opens when the inlet-cam allows the rod, C^4, to descend, because the spring, C^3, then overcomes the force exerted by the small spring fitted to the valve itself, and consequently depresses the valve. The extent to which the valve is opened depends upon the position of the sliding rod, C^2, because its upper end forms the fulcrum for the bridge, C^1. As the governor moves this rod upwards, so the inlet valve (1) is opened later, (2) is opened to a less extent, and (3) is allowed to close earlier, with the result that the quantity of mixture drawn into the cylinder is reduced. The governor, G^2, is mounted on the rear end of the cam-shaft. The accelerator, operated by the driver, interacts upon the governing system in much the usual way, varying the normal engine speed at will.

The guides in which the push-rods, actuated by the cams, slide are of special construction. One of them, H^3, is shown separately in Fig. 20, and they are seen in section in Fig. 15; two of them screw into each of the aluminium cam-chamber covers, H^1, at H^2. The upper portion of the guide is drilled out to receive the push-rod, and the lower part is bored to a larger size to receive a steel ball, H^4. The ball is prevented from dropping out whilst the engine is being erected, the lower edge of H^3 being slightly burring over, after the ball has been inserted, for this purpose. The ball itself comes into contract with the cam on its under-

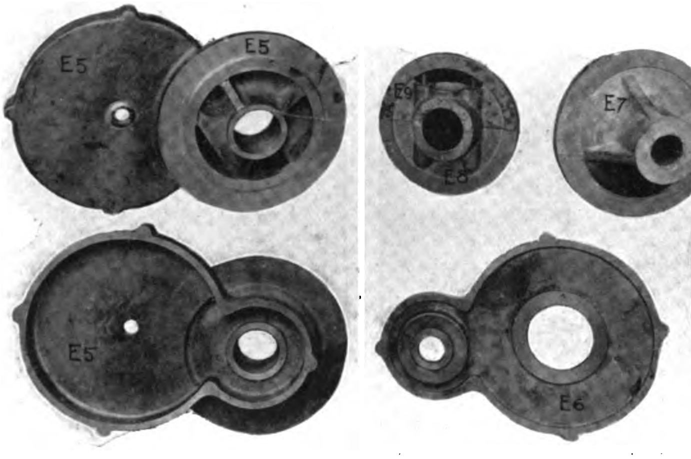


Fig. 19.—End-Castings, and one of the Central Bearings of Crank-Chamber.

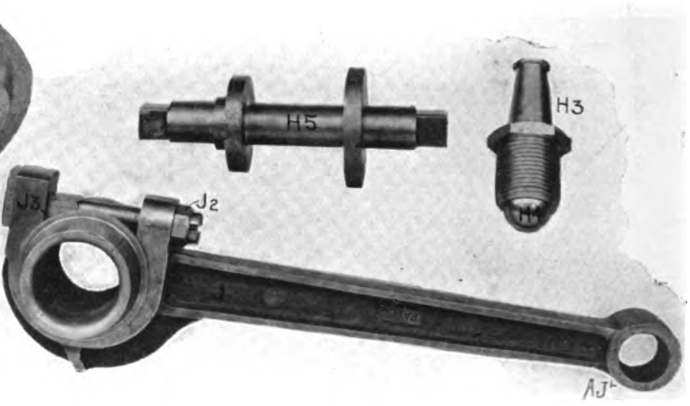


Fig. 20.—Cam-Shaft for one Cylinder, Guide for Push Rod, and a Connecting R

side, and the end of the sliding rod presses down on it from above.

The connecting rod, J, which is of interesting construction, is also shown in Fig. 20. It is made of cast steel, and is so shaped that the two halves of the brasses forming the big-end bearing can be slid into place from the open side formed by its forked construction. The joint lying between the two brasses is at an angle to the centre line of the rod, and they are forced together by means of a specially-shaped cotter which has a wedge-shaped face at J^3, and is tightened up by means of the castle nut, J^2. The action of tightening up the nut not only renders the forked portion of the connecting rod rigid, but also wedges the one brass tightly up against the other.

The piston is seen in Fig. 21, where it is shown sectionally, in plan and in elevation; the gudgeon-pin, J^4, which is hollow, is also shown separately, both from the side and the end. The chief objects of the design are to fix the gudgeon-pin, J^4, in place without allowing it to pass through the wall of the piston, and to allow the piston to be lightened by being machined inside as well as outside. The main portion of the piston is provided with internal projections against the under-side of which the ends of the gudgeon-pin are securely held by means of bolts, J^6. The bolts, J^6, and the blocks through which they pass, clip it to a bridge-piece, J^5, which rests on the upper face of the projections. The ends of the gudgeon-pin are squared on three sides where they fit against the projections, thus enabling the pin to be securely held in place and prevented from rotating about its own axis.

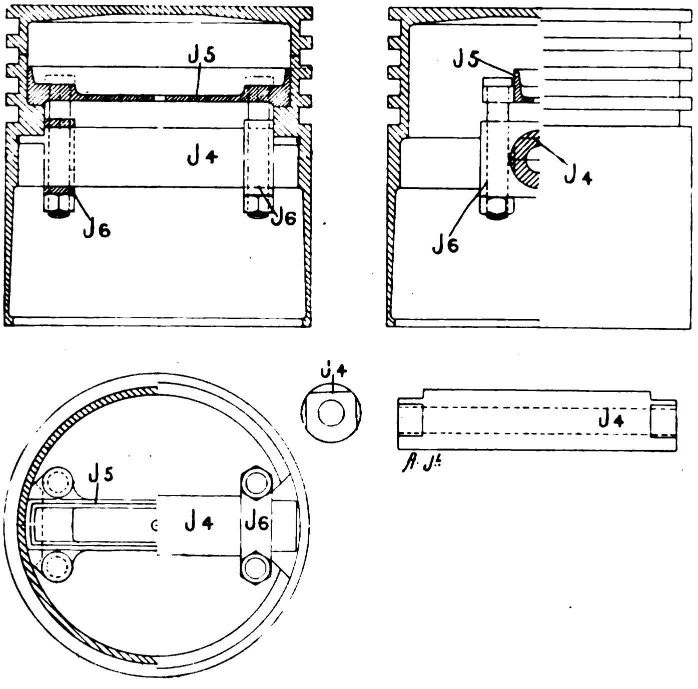


Fig. 21.—Three Views of Piston, and two of Gudgeon Pin (shown separately).

The two to one gear-wheels driving the cam-shaft are enclosed in the casing formed by the end castings, E^5 and E^6, of the crank-chamber. The front end, H^6, of the cam-shaft projects forward and carries the circulating pump, S. The water is delivered by the pump through the pipe, B^7, to the water jackets, from the tops of which it is led by the pipe, B^9, to the tank, and to the radiator, S^1 (Figs. 2 and 3). The front end of the crank-shaft carries the fan, S^2, immediately behind the radiator, and the shaft further projects, through the radiator, to receive the starting handle. The four exhaust pipes, D, are led to a common expansion chamber, D^1, from which the gases are taken to the exhaust box, D^3, by the pipe, D^2. The carburettor, I^1, is of the float feed spray type. It takes its warm air supply from a funnel-shaped pipe, the mouth of which lies near the expansion chamber, D^1. In the new engine, special care is being taken to form all the pipe connections in such a manner that sharp corners are avoided, thus giving an easy passage through them. For the mixture-supply and the water pipes care has also been taken to make the flow of explosive mixture, or the water, as equal as possible to all the cylinders. The new design for the expansion-box for the exhaust gases is shown in Fig. 22, as also is the branch pipe fitting for leading the water to each jacket. The water connections to the jackets are made with flexible and expansible fittings, which are shown clearly in Fig. 23. These connections screw into the cylinder casting, and are constructed with a rubber mouthpiece, B^{10}, into which the metal pipe-fittings fit, a tight joint being made between these parts by a turn or two of wire round them.

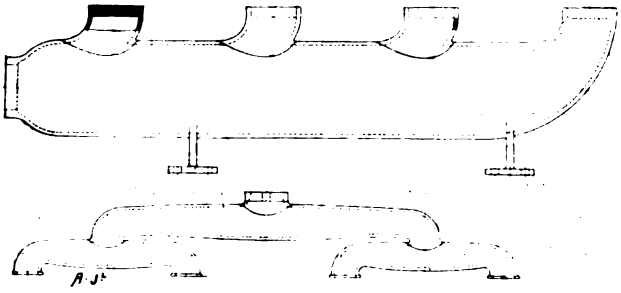


Fig. 22.—Expansion Chamber for Exhaust, and side elevation of Water-pipe Fitting.

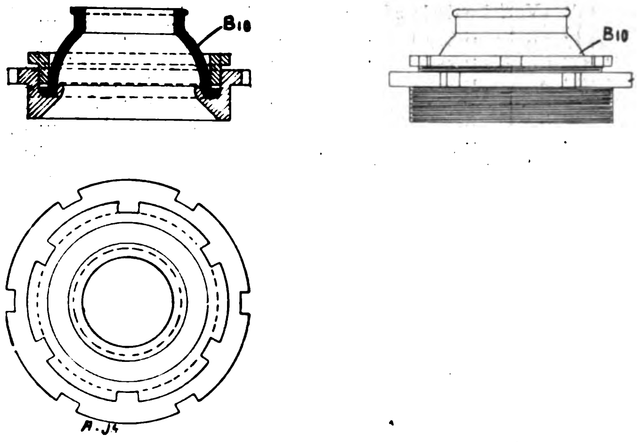


Fig. 23.—Rubber Expansion Joint for Water-pipes.

In the twin-cylinder Weller engines the two crank-pins are arranged in line with one another, and, of course, there is an intermediate bearing for the shaft between them; counterweights are fitted to the crank-cheeks to balance them as nearly as possible. From the foregoing description of the Weller cars it will be seen that a considerable amount of original work has been carried out by this enterprising firm in the development of their vehicles—work which ought to be rewarded by conspicuous success.

1,000 MILES' TRIAL OF MOTOR VEHICLES.

From time to time we have published the important points in regard to the rules for this trial, organised by the A.C.G.B.I., as they have been decided. The full rules have now been issued, and for the convenience of our readers we summarise them below.

The trial will take place from September 4th to 12th next, starting from and completing every day's run at the Crystal Palace. The Judges appointed are:—Mr. W. Worby Beaumont, M. Inst. C.E., M.I. Mech. E.; Mr. Dugald Clerk, M. Inst. C.E.; Mr. E. H. Cozens-Hardy; Lieut.-Col. R. E. Crompton, C.B., R.E.; Professor Hele-Shaw, LL.D., F.R.S.; Lieut.-Col. H. C. L. Holden, R.A., F.R.S.; Major F. Lindsay Lloyd, R.E.; the Hon. John Scott Montagu, M.P.; Mr. R. E. Phillips, M.I. Mech. E., A.M. Inst. C.E.; Mr. Lyons Sampson, M.I. Mech. E. The Secretary of the Judges is Mr. Basil H. Joy, A.M.I.M.E.

The routes will be:—

September		Miles.
4.	To Folkestone and back...	139½
5.	Eastbourne and back (Westerham Hill)	120
7.	Worthing and back (Bury Hill)...	120
8.	Winchester and back	133½
9.	Southsea and back (Hind Head)	144½
10.	Bexhill and back	121½
11.	Margate and back	147½
12.	Brighton and back (Hand Cross) (including Speed Trial)	87½
		1,014

The trial is open to motor vehicles made in the United Kingdom and abroad, the number of cars of any particular type and horse-power entered by a manufacturer or agent being limited to one. There are two sections, viz.:—

Section 1.—Vehicles entered by manufacturers or agents or by private owners. This section is divided into seven classes, viz.:

			Entrance Fee.
Class A.	Vehicles declared at a selling price of	£200 or less	... £12
„ B.	„ „ „	£200 to £300	... £14
„ C.	„ „ „	£300 to £400	... £16
„ D.	„ „ „	£400 to £550	... £18
„ E.	„ „ „	£550 to £700	... £22
„ F.	„ „ „	£700 to £900	... £25
„ G.	„ „ „	Over £900	... £30

Except in Class G, there must be at least three vehicles of different types entered or they will run in the next higher class. After July 11th up to August 15th, when entrance fees finally close, the above entrance fees will be increased 25 per cent. per week.

Section 2.—Parts of motor vehicles other than tyres, showing a distinct advance on any similar apparatus used in a trial held by the Automobile Club, such as ignition devices, governor devices, &c. Entrance fee, £5.

In the event of the entry fees and other receipts being in excess of the expenditure, the surplus will be proportionately returned to those paying entrance fees.

Competitors must state price at which they guarantee to provide to the public duplicates of the entered vehicles for all orders given before December 1st, 1903. Privately-owned cars will be classified according to list price. Parts under Section 2 must be arranged to be fitted to a motor vehicle by the competitor.

The bore and stroke and number of cylinders must be specified, and these measurements shall be checked after the trial by the judges at the written request of the owner or of three of the competitors.

Each competitor must nominate a suitable observer, and such observer will, when accepted, ride on a different vehicle as far as possible every day, but will not act as observer on the car of the competitor by whom he is found. Observers must not in any way assist drivers of cars, actively or by suggestions. Where, however, the observer is the only passenger, when requested he may assist with a pneumatic tyre puncture.

Excessive speeds will not be permitted, it being a trial of reliability and not of speed, and one mark per minute will be deducted for all time under the minimum time allowed between each stage, and transgression in this respect may lead to disqualification. Ten marks lost in this way in one day loses the car its record for the whole day. Through towns and villages and controls the speed must not exceed eight miles per hour.

All cars must carry their full complement of passengers of not less than 11 stone per person. Convenient seats must be provided similar to the cars as sold in the ordinary way by the makers, and temporary upholstery will not be permitted. Vehicles must be driven by the same person throughout the day's run unless the driver be incapacitated. In Section 1 only one acting mechanic will be allowed to be carried.

Awards will be as follows:—Section 1, Gold and Silver Medals, as first and second prize in each class. Section 2, Gold and Silver Medals. Three extra Gold Medals may be also awarded by the Judges to vehicles which they may consider to possess specially meritorious features, such as simplicity, accessibility, etc. The awards will be made by adding together the marks gained by the car during the Trial for

		Maximum Marks.			Maximum Marks.
(*a*)	Reliability	3,000	(*k*)	Absence of dust raising	500
(*b*)	Cleaning, replenishing, &c...............	1,500	(*l*)	Speed on track	500*
(*c*)	Hill climbing	1,000*	(*m*)	Re-starting on hill ...	250
(*d*)	Condition after trial...	1,000	(*n*)	Finish and appearance	250
(*e*)	Brakes	250	(*o*)	General cleanliness of motor and gear......	125
(*f*)	Steering	250	(*p*)	Fuel consumption ...	500
(*g*)	Absence of noise	250	(*q*)	Accuracy of h.p.	250
(*h*)	Absence of vibration..	250	(*r*)	Cheapness	250*
(*j*)	Absence of vapour or smoke	250			

* Price of car affects these marks.—Ed.

The method of marking will be as follows:—

Reliability.—The maximum number of marks for reliability for each day's run will be 375, and one mark will be deducted for every minute during which the vehicle is at rest, from the start to the finish of the run, except for three compulsory stops per day for refreshments (quarter of an hour in the morning, three-quarters of an hour for luncheon, quarter of an hour tea), traffic, tyre troubles, accidental detours, lighting carriage lamps. In addition, one mark will be deducted for every minute in excess of the official maximum time. The official maximum time will be based on an average speed of 10 miles per hour, plus extra time occupied in controls and dangerous zones. Five marks will be deducted from reliability marks for every tyre trouble stop.

Adjusting, Cleaning, and Replenishing—There will be 187½ marks each day for these, one mark being deducted for every minute during which a car is being adjusted, cleaned, lubricated, or replenished at the Crystal Palace, or during the luncheon three-quarter hour. Refilling tanks or oiling up when under weigh will not be allowed. At the end of the day's run vehicles must be immediately placed in the storage building, everyone except the Club officials being rigidly excluded, the drivers being allowed only to turn off the fuel, lubricant, current, and water. A maximum time of 20 minutes is permitted for this. In the morning one mark will be deducted for every minute occupied for the purpose of washing, replenishing, or repairs after the signal to start has been given. One minute will be allowed for actually starting the engine. Drivers requiring more than 20 minutes for repairs or adjustments must drive their vehicles into a special storage building for effecting what they require. Tyres may be changed in the storage building, one mark being deducted for every five minutes so occupied.

Hill Climbing.—Separate records of the time occupied in making the ascents will be taken for each of the hill climbs. The marks awarded for the hill trials will be calculated as follows:—

$$\frac{\text{C}}{\text{number of hills}} \times \frac{(6 + \text{number of passengers})}{(1{,}500 + \text{price in £}} \times \text{average grade per cent.} \times \text{speed in miles per hour.}$$

Full marks shall be 1,000.

Cars will take the hills with a flying start, the times being taken as the cars pass. The full complement of passengers must be carried, and the dropping of one passenger on a hill loses the marks for that hill. Sprocket changing will not be permitted.

Brakes.—Special tests will be held on September 3rd, and at other times, specially directed to testing the running backwards of a car if stopped on a steep up gradient. Marks, from a total of 250 allotted for brakes, will be deducted at the discretion of the Judges for inefficient brake power.

Accuracy of Declared Horse-Power.—A total of 250 marks will be awarded under this head to the car which has shown by actual performance on the hill to have given a horse power equal to or most nearly equal to the horse power at which it is described on the entry form. These marks will be arrived at by the following formula:—

$$250 \times \left(\frac{140}{100} \times \frac{\text{H.P. performance}}{\text{H.P. declared}}\right)^3;$$

the H.P. performance being arrived at by the following formula:—

$$\frac{(\text{Laden weight of car in lbs.} \times \text{vertical rise of hill in feet}) + (\text{length of hill in feet} \times 40 \text{ lb. per ton laden weight})}{33{,}000 \times \text{time taken in ascending hill in minutes.}}$$

The best performance on any of the hills will be the h.p. performance taken.

Steering Gear.—Marks will be deducted at the discretion of the Judges, or the car may be disqualified in respect to inefficiency of steering gear; a maximum of 250 marks will be given for this point.

Fuel Consumption.—The daily consumption will be recorded throughout the trials, a total of 500 marks being allotted under this head. The formula for arriving at these marks will be published later.

Speed.—A speed trial will be held at Brighton on September 12, for which a total of 500 marks will be awarded, arrived at by the following formula :—

$$\frac{\text{Speed in miles per hour} \times (6 + \text{number of passengers})}{1500 + \text{price of car in } \pounds} \times C.$$

Price.—Seven marks will be awarded to vehicles for every £1 per cent. that the price on the entry form is below the maximum price in the class up to a maximum of 250 marks; in class (g) the highest-priced car will be taken as the maximum price in that class.

Re-starting on Hills.—250 marks will be awarded for re-starting on the hill on which the brake trials are carried out. Each car will be required to traverse a distance of 15 yards in 30 seconds from a standing start. Three tries will be allowed, a third of the marks being deducted for each failure. Sprags may be used. Running back or lifting of the front wheels will not be considered a failure.

Marks for other points to be allotted at the discretion of the Judges are :—Absence of noise, 250; absence of vibration, 250; absence of vapour or smoke, 250; absence of dust raising, 500; finish and appearance before and after trials, 250; general cleanliness of motor and gear, 125. In judging noise, the vehicles will be required to travel on the various gears at the speeds claimed by the makers for those gears. The appearance will be judged both before the trials and after washing at the conclusion of the trials.

Condition of Car at the end of Trials.—The maximum marks allotted in respect of the condition of the car after the trial will be 1,000, and marks will be deducted by the Judges for parts replaced. A list of such parts will be published in the report.

Final Arrangement of Marks.—In working out the marks for various cars the marks gained by the car showing the highest number of marks (*irrespective of class.—Ed.*) under each formula will be raised or lowered by some constant to be arrived at later, and the marks for the other cars will be varied by the same constant.

Certificates will be given only in respect of vehicles making an average of not less than 10 miles per hour net on the total trials. Certificates will be issued to drivers who may successfully drive a car throughout the trials.

Competing cars must be at the Crystal Palace by 12 noon on September 1st, when each vehicle will be marked by the Judges. Duplicates of the competing cars may be displayed in the Crystal Palace during the trials at a charge of £5 per vehicle. On running days cars will not start before 7.15 a.m. The order of starting will be by drawing lots for each day. A vehicle not starting when officially started loses one mark per minute until it does start. No advertisements will be allowed on the vehicles. The carrying of spare outer covers of pneumatic tyres on a car so as to be within sight of the public is prohibited. The usual regulations as to disqualification and publication of results, protests, &c., complete the rules.

JOHN MARSTON, LIMITED, of Wolverhampton, are the first to enter a car for the 1,000 Miles' Trial in September.

The A.C. of America Commercial Vehicle Contest Awards.—The official awards are now announced as follows :—Class 1, to carry 750 lbs., Mobile Company (No. 10), Gold Medal. Class 2, to carry 1,500 lbs., Knox Company (No. 11), Gold Medal; Knox Company (No. 12), Silver Medal; International Company (No. 5), Bronze Medal. Class 4, to carry 6,000 lbs., Morgan and Co. (No. 9), Gold Medal. Class 5, to carry 10,000 lbs., T. Couldhard and Co. (No. 1), Gold Medal. A protest has been raised by Arthur Herschmann in respect to the awards, as he claims that he is entitled to a Gold Medal for his No. 7 steam express truck, according to the regulations published. The matter is under consideration by the Judges. We published details of this contest in our issue of June 13th, page 616.

G. A. BARNES, who has made such remarkable motor cycle records, on Tuesday last fell from his machine, breaking his arm, on the Canning Town Track, whilst attempting further records. Trouble with his front tyre was the cause of the accident.

MOTOR VOLUNTEER CORPS.

INSTRUCTIONS have been issued from the Home District headquarters respecting the organisation of this corps, which is described as "composed of gentlemen who are owners of motor cars, and who are willing to parade with their cars when required for military purposes, such, for instance, as the defence of the country, manœuvres, staff rides, &c." The establishment sanctioned provisionally is to be 203 officers and men, made up of 1 lieutenant-colonel (commanding), 6 majors, 19 captains, 19 lieutenants, and 155 volunteers (privates), with a permanent staff of 1 adjutant and 2 sergeants.

With the headquarters in London (11, Tothill Street, Westminster), the corps will be divided into five commands, distributed as follows :—(1) Aldershot; (2) Salisbury, with subordinate commands at Plymouth, Portsmouth, and Dover; (3) London, with subordinate commands at Woolwich, Chatham, Colchester, Guildford, Hounslow, Kingston, Oxford, Reading, and London; (4) York, with subordinate commands at York and Chester; (5) Scotland, with subordinate commands at Glasgow and Edinburgh.

No member will be considered efficient unless during each year he shall have attended on duty, with his car in working order, on not less than ten days; but should his services not have been required on so many days, he shall be considered efficient if he has attended on each day on which he has been called upon. A working day will consist of not less than six hours. The following special grants have been sanctioned :—(a) For each efficient an annual capitation grant of £2; (b) special capitation grants for efficiency in subjects to be detailed hereafter; (c) an allowance of 30*s.* for each day of attendance of an officer or volunteer on duty with his car, this allowance not being permissible for more than ten days annually for any individual.

MR. WILLIAM G. DAVIS-GOFF and Mr. Edwin Midgley have been duly gazetted as Captains of the Motor Volunteer Corps.

ALL the racing events organized by the Swiss Automobile Club have been cancelled.

NEXT Sunday a motor bicycle match has been arranged between Maurice Fournier and Rigal, to take place at the Parc des Princes, Paris.

A NEW American motor record for 5 miles is reported from Indianapolis, on June 21st, where 5 miles have been covered in 5 mins. 4⅗ secs.

A NEW record has been made by F. Silver for the distance between John o' Groat's to Land's End. He covered the distance on a motor bicycle in 64 hrs. 29 mins. running time.

THE petrol tractor "Durch," which is designed by the Automobile Gesellschaft of Berlin for military purposes, was subjected recently to a very satisfactory trial in the Templehofer field. The tractor carried on its own platform a weight of 3,000 kilogs., and drew two trailers, each carrying a load of 6,000 kilogs., making a total useful load drawn of 15,000 kilogs. (approximately 15 tons). A number of very exacting tests were carried out over sandy and most difficult soil, which, owing to the adjustable flanges on the tractor wheels, were in all cases satisfactorily negotiated. Particularly practical was found to be the method of getting over exceptional difficulties, by disconnecting the tractor, running it forward into a suitable position, putting on its brakes, and then drawing up the trailers one by one by means of the powerful winding gear with which the tractor is provided, the length of wire rope which the tractor carries being about some 350 metres in length.

The Cars in front of the "Lower Lode" Hotel on the Severn, near Tewkesbury.

Dr. Fernald, President of the Club, on his Oldsmobile Car, prepared for any weather.

The Cheltenham and Gloucestershire Automobile Club.—The First Run of the Season.

Derby and District Automobile Club.—Unfortunately, through a bereavement last week to Mr. Lawson, the visit of the Club members to Foremark Hall had to be abandoned, and, by way of compensation, a run was made to Uttoxeter, the meet of the members being at Ashbourne, up to which point no particular route was followed. A number of automobilists had driven out from Uttoxeter as far as Rocester, and the whole party then proceeded to the "White Hart," from whence, after a pleasant stop, the cars returned about six o'clock, the road chosen back to Derby being *viâ* Sudbury. The roads were in grand condition, and the afternoon run resulted in an extremely pleasant outing. Amongst those members who took part were Mr. Schwind, 16-h.p. Rex; Mr. Leech (hon. treasurer), 8-h.p. Decauville; Mr. Allin (hon. secretary), 8-h.p. Rex; Mr. Hunter, 6-h.p. Darracq; Mr. Pounds, $4\frac{1}{2}$-h.p. Benz; Mr. Reading, 3-h.p. Stirling; Mr. Guest, 9-h.p. De Dion; Mr. Fletcher, $3\frac{1}{2}$-h.p. Star; Mr. F. Smith, Clyde bicycle; and Messrs. Smith and Collumbell, Excelsior bicycles.

North-East Lancashire Automobile Club.—It has been decided to make the third Club run of the season on Saturday to Morecambe. An opportunity will be taken by the members participating in the outing to demonstrate to the local police at Garstang and Lancaster how ridiculous automobiles are when travelling at an extremely slow pace as the recent action taken by the police in this district has amounted lately to almost vindictive animosity.

For the convenience of their members a number of selected firms have been appointed as official repairers to the Club, the names of which will be notified later. Mr. Walmsley, of the firm of Messrs. Walmsley and Yates, solicitors, of Blackburn, has been appointed official solicitor to the Club.

ADVERTISING by means of pictorial posters is each year becoming more of an art. One of the latest productions in this respect is a picture issued by the Dunlop Tyre Company, which depicts two high-powered racing cars in full flight down a steep incline. The appearance of speed has been well secured by the artist, and the whole effect is both striking and original. In the ordinary course this is issued to members of the trade only, but as an excellent specimen of the lithographic art no doubt an application to the Dunlop Tyre Company, 14, Regent Street, or the works, Aston Cross, Birmingham, would result in the Company sending a copy to any really interested applicant.

THE Third International Automobile Congress will be held in Milan in 1905.

THE Scottish oil companies are reported to contemplate putting a supply of petrol on the market.

AMONGST the latest members elected to the Automobile Club are Professor H. von Herkomer and Sir W. Martin Conway.

LAST week the first steam lurry employed in Ireland by the G. S. and W. Railway Company was put into service for goods traffic between Dunmore and Tuam.

THE first of a number of public service petrol hansoms was put on the London streets last Monday by the London Express Motor Service, Limited, who were responsible for running the motor omnibus service between Putney and Piccadilly Circus.

SIR JAMES MALCOLM, BART., last week took over his 14-b.h.p. Daimler car at Coventry. The new 22-h.p. Daimler carriage which the Hon. John Scott Montagu, M.P., has recently acquired will be entered in several of the events during the Irish Fortnight.

THE notion of a scorching traction engine is one that appeals irresistibly to the sense of humour. It is, however, very easy for a traction engine to scorch, for in the Metropolitan district these unfortunate vehicles are limited to a speed of two miles an hour. One of them was recently summoned before Mr. Garrett at the South-Western Police Court for exceeding this limit, it being alleged that it was travelling a little over $2\frac{1}{8}$ miles an hour. The magistrate very naturally was not impressed by this example of unnecessary zeal on the part of the police, and dismissed the case.

THE Automobile Club are to be congratulated on issuing a very sensible, though at the same time stringent, caution to all motor car drivers who will take part in the Irish Fortnight. Particular carefulness is enjoined on the part of those returning to Dublin after the Gordon-Bennett race. The roads will be full, of course, of horse-drawn vehicles, many of which will be drawn by animals afraid of motor cars, and above all, as we have pointed out from time to time, a good many of the country carts are provided with projecting shafts at the back, which cause danger as the carts slew round. The caution is the more needed as the latter part of the road into Dublin is down hill, and the temptation to go at high speed will be considerable. The Club are taking the very proper course of prohibiting the passing of one car by another on downhills, at corners, or in towns and villages, or when proceeding to Dublin under any circumstances, unless the one car is going at an abnormally slow pace. The Committee is acting very wisely in requesting members to co-operate in attempting to prevent inconsiderate driving or racing, and by reporting any offences of this kind to them. The Club Committee very properly announce their intention of removing or suspending any member who may be guilty of any offences of the kind referred to. It is of the greatest importance that nothing should occur in connection with the Irish Fortnight or the Gordon-Bennett race to give an excuse to opponents of the movement for recommencing the Press campaign which has recently terminated.

* * *

WE felt quite sure that the anti-motorist spirit could not remain at the fever heat that characterised it during the height of the Juggernaut discussion. As we felt sure and also as we said, reaction was certain sooner or later to supervene, and a more reasonable frame of mind to ensue. Evidence of an improved state of feeling on the subject was provided in the House of Commons on Monday by the negotiations which have been in progress between Mr. Wason and other anti-motorists and certain members who were more favourably disposed to the new locomotion. This *rapprochement* is a very favourable omen, and we understand that the negotiations which have taken place lead to the conclusion that a measure on which both sides are practically agreed will be drafted at an early date. This measure is then to be put before Mr. Scott Montagu for his suggestions, and will subsequently be laid before Mr. Long, and should, at any rate, form a guide as to the sort of measure that it will be possible to get through the House without serious opposition. Certainly, as we have said, the anti-motorists must have cooled down considerably. When the last debate was in progress, led by Mr. Wason, any negotiations between the rival camps appeared quite out of the question. It even looked as if it would be dangerous to introduce the opposing parties into the same committee room, but as the weather has improved the legislative atmosphere seems to have grown cooler. Certainly we fail to see, either why Mr. Wason should have constituted himself the leader of the anti-motorists or how he or his constituents would be injured by the widest possible liberty, not to say license, being accorded to automobiles. There are no motor vehicles in the Orkney Islands, and, though prophecy is always a risky *metier*, one may almost venture to predict that they will never be very numerous there.

A MOTOR Omnibus Competition is being organised by the Automobile Club of Marseilles.

IN a run from Milan to Paris, three Italian automobilists ascended the Petit St. Bernard, which has a rise of 7,176 ft., a performance which has so far, it is reported, been unexampled.

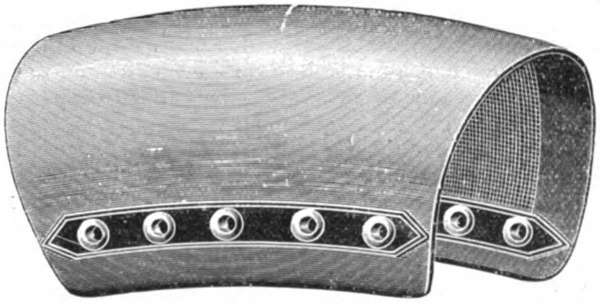
LAST week M. Darracq, on the occasion of his being appointed to the Legion of Honour by the French Government, was entertained at a banquet in Paris, when an enormous gathering of well-known members of the automobile world foregathered.

THE Selden Patent question does not seem to be by any means settled in the United States. The two particular companies which are declining to recognise the validity of this claim are the Ford Automobile Company and the Marr Autocar Company, both of Detroit.

THE Peerless Motor Car Company, of Cleveland, U.S.A, have purchased a large tract of property adjoining their present factory, preparatory to enlarging the premises to cope with the demand for their cars, which appears to be going up by leaps and bounds in America.

MESSRS. DEBENHAM AND CO., of Welbeck Street, W., have determined to put into service a number of travellers' automobile broughams, in connection with their well-known business. They have placed a contract for the supply of these vehicles with Messrs. Clarkson (Limited), of Chelmsford.

FOLLOWING the example set by Leipzig, the chief of police of the city of Strasburg has interdicted the employment of automobiles of all kinds in the inner circle of the town. This practically means the mediæval portion of the city enclosed between the old circle and the walls. It is, after all, a less unreasonable proposal than in the case of Leipzig, as the majority of the streets in this part of Strasburg are exceedingly narrow and crooked.



The above illustration shows a new gaiter which the Dunlop Tyre Company have introduced, and which is intended for use with a burst motor tyre cover. It is built up of rubber and canvas, vulcanised together, forming a material very similar to that of the tread of the tyre itself. Eyelet holes are provided for lacing it in place over the cover, and these are protected by brass liners which pass through leather straps both inside and outside. The gaiter is made in various sizes for tyres of from 2½ inches to 5 inches across. In cases of emergency, as when a cover might have been badly cut by any unusually sharp body on the road, this gaiter would certainly be invaluable, and we have no doubt that it will therefore form a part of the repair outfit carried by the majority of motorists.

The Packard Motor Car Company are removing from Warren, Ohio, to Detroit, Mich., where they have purchased 18 acres of ground in a very important portion of the city. The removal will not take effect for several months. A new departure is to be made by the company for next year, when they propose marketing a four-cylinder car, with vertical motor, selling at about £500, 1,000 of which will be laid down.

The National Assembly of Switzerland has decided, by a majority of 92 votes to 35, that in future any unfortunate automobile proprietor who gets involved in an accident shall be liable in damages to any person injured unless he can prove that the accident was due to the interference of a "higher power" to negligence on the part of the person injured, or to the action of third parties. This new law will make things highly enjoyable for Swiss automobilists, or automobilists, we presume, visiting the country. No wonder, therefore, that the Swiss Automobile Club has cancelled all its racing fixtures.

An Electrical Chair Company has been formed in connection with the St. Louis World's Exposition next year. This Company has obtained an exclusive concession to supply 2,000 automobile bath chairs during the run of the show. They will carry two persons, and the charge will be 2*s.* per hour; it is stated that they will be so simple to manipulate that any ordinary person will be able to take charge of them and drive them round the grounds of the Exhibition, the speed being about one to three miles per hour. Nevertheless, we fancy there will be some rather unexpected encounters in spite of the extreme simplicity of the arrangement. Some people cannot even push a perambulator without running into every other person they meet.

M. Santos Dumont gave quite a sensational illustration on Tuesday last of the control which he is able to exercise over the evolutions of his little airship. Early in the morning he left the shed at Neuilly and flew straight in the direction of the Arc de Triomphe, round which he circled and cut figures, to the great delight of the passers by, and then betook himself home to his flat in the Avenue de Champs Elysees for breakfast. He halted exactly opposite his window, and his original intention was to have landed at the platform on the window-sill, but his servants were not awake, and so he had to drop to the pavement between the house and the trees of the Avenue, close up to the door. This he did most successfully, executing the difficult manœuvre with as much precision as if he had been in an automobile. After breakfast, he mounted his airship and returned to Neuilly.

The National Association of Automobile Manufacturers in America have for some time been inclined to dispute the authority of the Automobile Club of America to hold all endurance and other tests. They have now given expression to this feeling by announcing that they intend to hold an Endurance Test in the autumn, quite independently of the A. C. of America's proposed Endurance Run to Montreal and back from New York. The route selected by the N.A.A.M. will probably be from New York to Pittsburg, *viâ* Philadelphia, Wilmington, Baltimore, and, possibly, Washington, a distance, roughly speaking, of 500 miles, spread over three days. Stops, fuel, brake efficiency, and other points will be taken into consideration. This distance may possibly be prolonged by detours. The selected route would certainly be a severe test, especially if the weather happens to be bad, in which case it might be expected that a very large proportion of the cars would fail to accomplish the run through. In addition, the Association is planning a contest for commercial vehicles, particulars of which are to be announced later. A special Technical and Organising Committee has been appointed, composed of Messrs. A. L. Riker, Chairman, H. W. Alden, Charles E. Duryea, Rollin H. White, and Hart O. Berg. Mr. S. A. Miles, of Chicago, proprietor of the *Motor Age* of that city, has been appointed "Manager" of the Association, Mr. Miles at the same time receiving a three-years' contract from the Association to run an automobile show in Chicago, at the Colisseum, which will be the official Show of the Association. Mr. Miles relinquishes his ownership of the *Motor Age* under these conditions, taking offices in New York for organising his exhibition. The N.A.A.M. have also determined to contest the legality of some of the clauses in the much abused Baily law.

"Gordon-Bennett Supplement to Black's Guide to Ireland," by R. T. Lang. London: A. and C. Black. In reviewing "Black's Guide to Ireland" a short time ago we drew attention io the fact that the volume had appeared before the arrangements for the Gordon-Bennett Race were completed. We have therefore much satisfaction in drawing the attention of our readers to a Supplement to this work recently brought out by the publishers for the special use of those attending the Gordon-Bennett Race and the Irish Fortnight. The little work contains a very good history of the Gordon-Bennett Race, some notice of the drivers who are taking part, a programme of the Irish Fortnight, and considerable information of the various routes by which the motor cars and motorists will most conveniently reach Ireland. A map of the course is provided on the cover, accompanied by a very good description both of the road itself and the most advantageous points from which the Race can be viewed.

DOINGS OF PUBLIC COMPANIES.

British Germain Motor Car Co., Ltd.—At an extraordinary general meeting of this company held last week, subject to confirmation, it was resolved that, it having been proved to the satisfaction of the company that it cannot by reason of its liabilities continue its business, that it is advisable to wind up the same, and that the company be wound up accordingly. Mr. F. B. Smart, of 22, Queen Street, Cheapside, is appointed liquidator.

Electrical Vehicle Syndicate, Ltd.—A general meeting of this company will be held at 6, Old Jewry, on July 17th, to receive an account of the winding-up by the liquidator.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1902.

Published July 2nd, 1903.

10.700. A. T. Collier. Internal combustion engines.
13.540. Durieu and others Change-speed gear.
14,227. E. Gardner and others. Internal combustion engines.
15,807. C. de Sedneff. Accumulators.
16.052. Soc. F Charron, Girardot, and Voigt. Exhaust valve governors.
16.053. Soc. F. Charron, Girardot, and Voigt. Carburettors.
16.056. Soc. F. Charron, Girardot, and Voigt. Construction and attachment of mixture admission pipes.
16.059. Soc. F. Charron, Girardot, and Voigt. Carburettors.
17.113. W. Starley. Motor cycle frames.
17.305. Albany Manufacturing Company (Limited). Oil burner for heating steam generators.
18.091. M. and E. Werner. Carburettors.
18,753. E. L. N. Denis. Steering mechanism.
22,509. J. N. Howard. Motor cycles.

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